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ABSTRACT

A project developed a computerized data file of essential vocabulary, signs, and illustrations to be used to train deaf or hearing-impaired adults. Project activities included the following: designing a data entry and retrieval system for the project; identifying the interactive vocabulary most needed by deaf employees and their co-workers; illustrating the signs from American Sign Language (ASL) for each concept; illustrating the concept; writing definitions and sentences for each concept; and entering the data into a Macintosh computer Hypercard file. The end product is a set of more than 500 data cards with workplace-relevant vocabulary, each including an illustration of the signed work or phrase in ASL, a description of how to make the sign, a definition of the word or phrase, a series of work-related sentences using the word/phrase, and an illustration demonstrating the meaning of words that can be pictured. The cards are divided into 28 topic areas. The data may be accessed directly on the computer or may be printed out into little dictionaries of vocabulary for use by literacy trainers, employers, or employees at work sites. (This report includes four appendixes: an alphabetical listing of datafile entries, a categorical listing of datafile entries, sample printout options, and resumes of project staff.) (Author/KC)

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ED342896

DEVELOPING A COMPUTER DATA FILE: SIGNS, ILLUSTRATIONS, AND VOCABULARY FOR USE WITH AND BY HEARING-IMPAIRED ADULTS

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CE 060 419

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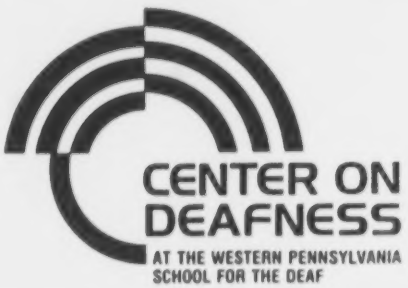
Developing a Computer Data File: Signs, Illustrations, and Vocabulary for Use with and by Hearing-Impaired Adults



ABSTRACT

This project was initiated to develop a computerized data file of essential vocabulary, signs, and illustrations geared toward the workforce literacy needs and training of deaf/hearing-impaired adults. The major objective was to provide a flexible, easily accessible and highly individualized source of workforce literacy materials for use by literacy trainers working with deaf adults, by employers, and by deaf employees themselves. This required designing a data entry and retrieval system for the project; identifying the interactive vocabulary most needed by deaf employees and their co-workers; illustrating the signs [from American Sign Language (ASL)] for each concept; illustrating, where possible, the concept itself; writing definitions and sentences for each concept; then entering the data into a Macintosh computer Hypercard file.

The end product is a set of over 500 special data "cards" with workplace relevant vocabulary, each including: (1) an illustration of the signed word or phrase in ASL, (2) a description of how to make the sign, (3) a definition of the word or phrase, (4) a series of work-related sentences using the word/phrase, and (5) an illustration to demonstrate the meaning of words which can be pictured. These stacks are divided into 28 different topic areas for optimum retrieval by the user -- including overall topics such as "Common Signs", "On the Job", and "Directions", plus site-specific topics such as "Fast Food" "Supermarket", "Mail Room" and "Hospital". The data may be accessed directly on the computer or may be printed out into tailor-made "mini-dictionaries" of vocabulary needed by the literacy trainers, employers, or employees at a particular work site.

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Introduction

INTRODUCTION

To help individualize workforce literacy instruction for deaf and hard-of-hearing adults and to facilitate their smooth integration into the workplace, this project has produced an extensive computer data file of work-related vocabulary, sign language illustrations, descriptions, definitions, and corresponding sentences. The project, Developing a Computer Data File: Signs, Illustrations, and Vocabulary for Use with and by Hearing-Impaired Adults, was initiated by the Center On Deafness at the Western Pennsylvania School for the Deaf in response to needs discovered during prior years of adult and workforce literacy training with this population. It offers, in particular, a unique Hypercard data stack which literacy trainers can use to address the individualized on-the-job vocabulary needs of deaf adults and their co-workers. In addition, it provides an alternate means for expanding or clarifying vocabulary which deaf adults may use in interactions with normally-hearing contacts in the community or in family situations. The data in this stack may be accessed directly on the computer or may be printed out into mini-dictionaries, according to 28 different topic areas, plus the manual alphabet and basic number signs.

Rationale

Most adults with severe or profound hearing loss, especially those who have been deaf from an early age, have missed out on significant portions of the spoken language through which most people interact and learn to talk, read, and write. As a result, they experience many gaps in the vocabulary and language needed for

workplace interactions and performance, as well as for community exchanges and activities. These deaf adults may know the American Sign Language (ASL) signs for the words, but not know the corresponding written (English) vocabulary and usage essential for on-the-job interactions and for understanding key job tasks and directions. To provide clearer meaning to the vocabulary being used, these employees may well need pictures of the referent, plus definitions and/or examples of the words in functional sentences.

The hearing peers of these deaf employees, on the other hand, may well know the English vocabulary relating to their jobs, but still be unable to communicate easily with their deaf co-workers, because they can neither sign nor understand the ASL equivalent of these spoken and written words. In workplace situations with both deaf and normally hearing employees, therefore, both groups have a mutual need for learning basic job-specific written vocabulary and the corresponding ASL signs. Direct training by a skilled instructor is essential to provide this mutual competency, including sign language classes or tutoring for the hearing co-workers and training in work-specific written vocabulary for the deaf employee. However, as an adjunct to this instruction, it is important that each of these trainees, deaf and hearing, have readily available and motivating practice materials--references to help them recall the signs or the English vocabulary needed.

Because many of these trainees are also quite busy, adding the sign language training onto already full work and family responsibilities, it is also critical to make these practice materials as easily and quickly accessible as possible, especially for key words

that would be relevant in their immediate situations. The purpose of this project, therefore, was to provide -- through the development of a workforce-relevant computer data file -- a quick and motivating means for providing workplace vocabulary and sign language practice, not only for the deaf worker but also for his hearing peers, supervisors, and fellow employees.

Background:

During a recent Workforce Literacy project at the WPSD Center, the literacy instructor created individualized sign and vocabulary sheets for each job site, in order to provide the practice materials which she found essential for her trainees. To do this, she had to make Xerox copies of relevant signs from sign language books, then cut, paste, and put them together in groups for each site (e.g., one set for fast food establishments, another for supermarkets, still others for banks, for hospitals, or for landscaping companies). That process, although effective, was quite time-consuming and, because of copyright problems, could not be distributed beyond the single class or site. Both a review of the literature and personal contacts with major research sites in deafness indicated that no other truly individualized options (short of sign language tutoring) were currently available to address this problem. Because of their necessarily rigid format, sign language books cannot provide for individualized "clumping" of relevant signs for job or community sites, and sign language vidoetapes are neither immediately and cheaply accessible nor are they available for most workforce signs or for other signs needed in adult interactions.

To address this need, the use of computer technology was then considered. It was determined that individualized practice materials might most easily be made available by assembling common and job-related signs, words, pictures, and related text into a Hypercard stack for later retrieval according to need. Such material not only could be made available on computer to anyone having the Hypercard program, but it also could be used to make individualized "mini-dictionaries" accessible within moments for the literacy instructor or workforce liaison, and available for distribution to other literacy programs nationwide. To further develop these possibilities, the current project was designed.

Time Frame

The basic time frame for this project was 7 months -- from project approval in November 1990 through June 1991. [Although data entry and single concept retrieval were complete by the end of June, access to the multiple print-out options for this data file was unavoidably delayed until the contracted data retrieval program for the computer could be completed, in November 1991.]

The adult and workforce literacy activities which led to the design of this project preceded it by three years and continue now that the project is complete. These programs, in turn, are now using and benefitting from the Hypercard stack developed through this project. Follow-up entries into the data file, with new words and concepts considered important to the deaf consumers and their employers, are continuing as part of the Center commitment.

Key Personnel

The project was conducted through the Center On Deafness at the Western Pennsylvania School for the Deaf (WPSD Center). The Executive Director, Dr. William N. Craig, was responsible for the administration of the project, with day-to-day coordination of project activities and editing of the data entries provided by Dr. Helen B. Craig, Research Director for the WPSD School and Center. Rosemary Garrity, Director of Center Programs, served as liaison between this and related Center programs, in particular the Adult and Workforce Literacy components, and supervised the personnel providing accuracy checks on the sign language illustrations and descriptions.

The persons compensated with project funds, all on a part-time basis, included the Literacy Coordinator, Sandra Mertens; the Data Entry Person, Patricia Karn; and the Illustrator, Susan Sgourakis. The Literacy Coordinator averaged 8.5 hours per week on this project throughout its operation (for a total of 269 hours), selecting vocabulary and concepts for entry, writing the script portions for each entry (sign descriptions, definitions, and sentences), and checking each printout for accuracy once the data had been entered. The Illustrator worked on a contracted basis for 795 hours, producing line drawings for each of the ASL signs included in the data base and illustrating the concepts, too, for any words which were easily pictured. The Data Entry Person worked 181.5 hours on this project, entering both the script and graphic information.

In addition, as part of the matching funds, the Research Director spent 60 hours on this project and the Director of Center

Programs, as project liaison, spent 40 hours. Dr. Ravinder Chandhok, a computer expert from Carnegie Mellon University, was contracted to provide computer consultation and to write the necessary programming procedures for data entry in the Hypercard system; and Gregg Podnar, Research Associate at the Engineering Design Research Center, Carnegie Mellon University, was contracted to write the retrieval programs. These computer consultants spent approximately 35 hours in the process, both as part of the matching funds.

All individuals working on this project were highly qualified for the positions described. The persons selecting and writing the text materials all are state certified as instructors of hearing-impaired persons and have many years of professional experience in this area, including three years each specifically involved with adult and workforce literacy. The Literacy Coordinator, who was simultaneously working as the Adult Literacy instructor for five classes of deaf adults, provided commentary and evaluation on the on-going file development. The computer experts and data entry person have each had a great many years of experience in their respective areas. The qualifications of all participants are presented in their vitae. (See Appendix.)

Audience for this Report

This report has been prepared for personnel who work in any capacity with deaf or hard-of-hearing adults, or who work with other individuals having communication disorders. With the passage of the Americans with Disabilities Act in July 1990, more and more companies, industries, and corporations are seeking information on

employees with disabilities -- including requests for sign language training for employers and co-workers. The computer data file developed through this project should prove of value to many literacy coordinators and others who are providing the sign language training, and it should also be of value to the hearing-impaired employees themselves, as they expand vocabulary needed on the job.

Available Resources on Adult Basic and Literacy Education

Information on adult basic and literacy education can be obtained by writing:

Division of Adult Basic and Literacy Education Programs
333 Market St.
Harrisburg, PA 17126-0333
Telephone: 717/787-5532

Permanent copies of this report and copies of the computer database, on disk, are available for the next five years through:

AdvancE
PDE Resource Center
333 Market ST
Harrisburg, PA 17126-0333
Telephone: In PA -- 1-800-992-2283
Out of state -- 717-783-9192.

Chapter I

Statement of Problem

I. STATEMENT OF PROBLEM

Purpose

This project was designed to incorporate the flexibility, motivation, and individualized tailoring capacity of computer technology into literacy materials for use with and by deaf adults and by their employers/co-workers on the job site. In this process, it was geared toward a goal of mutually effective, efficient and comfortable communication between deaf and normally-hearing persons in the workplace.

In the months preceding this project, the Workforce Literacy Coordinator and Job Placement Coordinator at the WPSD Center had taught over 40 communication mini-courses or seminars to more than 400 employers and co-workers of deaf employees. In the 5 or 6 hour-long sessions which the companies allotted to these mini-courses, the instructors needed to select the most essential communication pointers, the vocabulary critical for job understanding and performance by the deaf employee, and vocabulary or phrases to make the job environment more comfortable for deaf and hearing employees working together. With only 5 or 6 hours in which to teach, the instructors could not present the full range of signs in the American Sign Language. Rather, for each employment site and each level of job placement, they needed to pick out those signs which were most essential and timely -- signs which would capture the attention of the class participants and be immediately relevant to them for the workplace interactions. Clearly, the "essential" signs varied widely depending on the site, but with careful selection, the literacy instructors could and did provide both a good

foundation for the participants and motivation for many to expand their communication competence. Their success has been documented through follow-up evaluations. Other than the teachers themselves, however, the basic source of information and practice for these initial classes was the "cut, paste, and Xerox" materials which needed to be prepared each time to assure job-site relevance. The mutual sign and English vocabulary needed to communicate, for example, at a Burger King or MacDonald's might include "hamburger", "french fries", "tomato" and "onion"; whereas, in a hospital setting, vocabulary such as "nurse", "hurt", "medicine", and "bed" would be more critical. In a limited time frame, only those words which were most relevant could be taught with any effectiveness.

The computer data-file idea was conceived as a result of this laborious cut and paste process -- as a way to facilitate the essential individualization of vocabulary and signs at numerous job sites. It was determined that, once the vocabulary and signs had been entered into a computer base, they could much more easily be retrieved into optimally useable "chunks" for individual workforce sites, for community situations, or for whatever unique needs might be determined.

Audience

The target audience for this project was comprised of deaf/hearing-impaired (H-I) employees and their co-workers, and of deaf/H-I adults in literacy classes across the Commonwealth and nationwide. These individuals have in common a need for specific vocabulary to use in communicating on the job, in the community or at home, in situations involving both deaf and normally hearing

persons.

In Pennsylvania, there are an estimated 563,904 deaf/H-I adults of employment age (Governor's Policy Office, 1988), of whom approximately 6,909 are deaf from birth. It is this latter group in particular -- those who are prelingually and profoundly deaf -- who were targeted by this project. These individuals, because they do not hear the constant verbal interchanges through which spoken language -- and later, reading and writing -- are ordinarily learned, have been found in repeated nationwide studies to have a median reading level of 4th grade or below (Trybus et al, 1977; Allen, 1986). Although they may be highly intelligent and capable of excellent job performance, many of these deaf adults have severe literacy problems which require continuing remediation even after standard schooling is complete. Because they miss much of the spoken interaction around them, they also miss the instructions, the explanations and the comradery of their supervisors and fellow-workers who have normal hearing, but who cannot communicate through Sign. These employers and co-workers of deaf employees were therefore an additional target audience for this project.

Chapter II

Objectives

II. OBJECTIVES

The overall goal of this project was to develop a computer data file which would serve as a flexible, easily accessible, and highly individualized source of materials for use by literacy instructors, job coaches, and others working with deaf/H-I adults. The specific sub-objectives, all integrally relating to this goal, were:

A. **to design a data entry and retrieval process** through which the proposed data file could be established;

B. **to identify and select a comprehensive set of words and phrases** which most realistically might be needed for communication between deaf employees and their co-workers, and by H-I adults in community interactions identified in the literacy classes, specifically:

   1. common words and phrases needed in everyday interactions, to facilitate communication on the job or in the community;
   2. words common to many interview and job situations;
   3. words unique to specific job sites.

C. **to illustrate these words both with the pictured signs and with illustrations of the object/action:**

   1. to provide graphic information/reinforcement both for the hearing person having to produce a very different and visual language, and for deaf persons with English language deficits; and

2. as a mutual help in easing communication between H-I adults and normally hearing persons at work and in the community;

D. **to provide text definitions, descriptions, and highly functional sample sentences, using these concepts**, in order:

1. to expand the deaf employee's or literacy student's comprehension of a signed or vaguely understood written word; and
2. to clarify multiple meanings within the options offered;

E. **to produce,** within the limitations of the data entered, **a functional, highly accessible, and individualized data file,** which allows the user or instructor to tailor his/her data requests to fit the unique needs of each workplace, each community, and each H-I adult.

Because each of these objectives was integral to the production of a single product -- the computerized data file -- the procedure for development of that product will be discussed in a single chapter, Chapter III, below. The sub-objectives, which were implemented as cumulative steps in the process of developing the data file, will be discussed in sequence within that chapter. The product itself, the computer data file of signs, illustrations and vocabulary for use with deaf/H-I employees, will then be presented in detail in Chapter IV. Chapter V will present the conclusions and recommendations emanating from this project.

Chapter III

Procedure: Development of a Workforce Data File

III. PROCEDURE

The implementation of this project and development of the proposed data file proceeded through 5 overlapping but progressive steps, in line with the sub-objectives cited above:

1. Design of the Data Entry/Retrieval Process;
2. Identification of Workforce Vocabulary Needs;
3. Illustration of Workplace Signs and Vocabulary;
4. Composition of Text Definitions and Sentences; and
5. Data Entry/Editing/Production of Data File.

These steps are discussed below.

Design of Data Entry/Retrieval Process

The basic components to be included in the workforce data file were determined prior to project development and included:

-- the word or phrase to be illustrated/defined;
-- an illustration of the ASL sign representing that word or phrase;
-- a description of the ASL sign production;
-- hints/origins re: sign production;
-- a definition of the word/phrase;
-- a series of sentences using the word/phrase in contexts relevant for workplace and community interactions;
-- an illustration of the word, where feasible.

Once the project was begun, a computer programming expert from Carnegie Mellon University, Ravinder Chandhok, was consulted re: the optimum way to enter and retrieve these seven components. It was determined that all components, four text and two graphic, could be entered in a Macintosh SE (FDHD) computer with high density external storage capacity, using Hypercard, a relational database. Mr. Chandhok then wrote the routines for establishing the cards, so that the data entry could begin. The basic procedure,

using Hypercard, was to create a data stack in which each "card" of the stack would represent a single word, phrase or concept. On that card would be data for each of the elements listed above: the written word, the ASL sign, the illustration of the sign, a word description of the sign, hints and origins, a brief definition, three or more sample sentences using the word, and a picture. In several cases, especially with the definitions and sentences, the information needed was too extensive to be viewed in its entirety on the computer screen. Therefore, to allow extended information, alternate definitions, and a greater variety of sentences when necessary, the program was written to specify that the information could be scrolled for viewing on the screen.

In the initial stages, basic sorting and print routines were also programmed, so that the cards could be sorted and printed out alphabetically or by topic, with all information on a card printed onto a single page (e.g., the word with all its corresponding illustrations and text). Once the data had been entered, additional print routines were written, to allow the user of this data file to print all the data per word or to include any one or more of the text and graphic components in a variety of combinations and permutations. For example, the literacy instructor who simply wanted a series of sign illustrations relating to a topic could print out as many as 6 illustrations per page. Alternatively, he/she could print out 2 sign illustrations per page, in combination either with descriptions of how to make the signs or definitions of the words illustrated. These retrieval routines, discussed in more detail in Chapter IV, were written by the second computer consultant, Gregg

Podnar, who is an expert in "Hypertalk", the computer language necessary for developing the retrieval options.

Identification of Workforce Vocabulary Needs

The selection of vocabulary and signs to be entered into the computer data file were determined primarily by the Literacy Coordinator, in consultation with the Project Coordinator. The majority of vocabulary entries were based on prior experience in the Literacy programs, especially the Workforce Literacy project of the preceding year (a program also funded through a 353 grant).

Included were: "Common Signs" and "Common Phrases", sets of signs which were taught at all sites (e.g. "please", "sorry", "good", "friend", "What time is it?", "My name is..."), plus basic "On the Job" vocabulary (e.g., "boss", "can", "work") and signs for "Interviews" and "Following Directions". Community, family, and daily living signs were also selected, in topics such as "Around the House", "Family Relations", "People", and "Safety/Survival". A very vital series of topics included those specific to different job sites -- e.g., "Fast Foods", "Supermarket", "Hospital", "Bank", and "Mail Room". Clearly, considerable overlap among categories is inevitable. Words needed for a job in the hospital setting are also appropriate for use in daily health and personal care; and signs for "Fruits and Vegetables" can be needed in the supermarket, in fast food establishments, and in the home. Any of the words or signs, therefore, were programmed for retrieval within any number of possible topics.

Illustration of Signs and Vocabulary

Once the words had been selected, the Literacy Coordinator found illustrations of each word in standard sign language books. These included: A Basic Course in American Sign Language (Humphries et al, 1988); The Joy of Signing (Riekof, 1979); The Gallaudet Survival Guide to Signing (Lane, 1987); Signing: How to Speak with Your Hands (Costello, 1983); Basic Sign Communication: Vocabulary (Newell, 1983); Signs for Me: Basic Sign Vocabulary for Children (Bahan et al, 1987); Comprehensive Signed English Dictionary (Bornstein et al, 1983); The American Sign Language Phrase Book (Fant, 1983), and The Perigree Visual Dictionary of Signing (Butterwowrth, 1983). In some cases, a sign could not be found in any standard book, so the Literacy Coordinator demonstrated the sign production for the illustrator.

The sign language pictures or demonstrations were given to the illustrator, who made large (8.5" by 11") black and white line-drawings of the signs, using clear-cut strokes which could be easily scanned into the computer. The large drawings were then reduced to a 2.5" by 2.5" size for computer entry. The Data Entry Person scanned the reduced illustrations, using an Apple Scanner and "AppleScan" software, then retouched the resulting graphic on the computer screen, using Hypercard. This retouching process was necessary because computer scanning is by "pixel" or dots, not by solid line, and does not always render a clear reproduction of the original. Therefore, final resolution of the computer scanned drawings often required editing.

In the process of determining the words to be selected, fre-

quency of need was the major determining factor. An additional criterion was the availability of a legitimate sign for the potential word. In some cases the preferred "sign" by deaf signers is to fingerspell the word; and this preference was honored in this data file. It should also be noted that, even among sign language books and deaf signers themselves, there are differences in preferred usage or production of some signs -- just as users of English words and grammar are not always in perfect agreement. In some cases, where two alternate signs were both commonly used, both have been included in the data file. In others, the choice made was based on frequency of observed use (both in standard sign books and in live conversations).

Once the signs had been scanned into the computer, along with the descriptions of making the signs, a comprehensive editing process was used. The sign illustrations themselves were checked by at least two persons, with all signs checked by the Literacy Coordinator (an accomplished signer and teacher of sign language) and by a profoundly deaf teacher at WPSD who is a native user of ASL. Two other deaf teachers and two registered interpreters for the deaf provided additional input on the signs when usage questions were raised. The sign illustration and the description of the sign production were also checked by the Project Coordinator to assure consistency between the two entries.

In addition to the sign illustrations, another graphic field in this data file is one containing illustrations of the words themselves -- so that a picture of a house accompanies the word "house", and a picture of several people in a meeting accompanies

the word "meeting". For words which were easily pictured -- i.e., nouns such as "boy" and "girl", two entry options were used: (1) the illustrator made a line drawing, which the data entry person then scanned into the computer; or (2) the Data Entry Person located a "clip art" illustration, which she then scanned into the file.

For some words, e.g. "problem" or "hurry", no simple line drawing could be made which could be scanned into the limited computer space or which would help clarify the meaning of the word. Therefore, no attempt was made to include a word picture in these cases. In addition, time and financial constraints limited the number of pictures which could be included. Because the sign illustrations were considered more essential for this file than the "word pictures", they were given priority in the production process. Therefore, <u>all</u> words entered have sign illustrations, as well as including all the text fields; whereas several possible word pictures have not yet been entered in the graphics field.

<u>Composition of Text Definitions, Sign Descriptions, and Sentences</u>

The Literacy Coordinator, Project Coordinator, and Data Entry Person all combined efforts to write and rewrite information for the text file -- including: descriptions of the sign production, hints or sign origins, definitions, and sentences which would be both relevant and easily understood.

Because the books containing the clearest sign illustrations were usually not the same as those having useable <u>descriptions of the signs</u>, and because the descriptions are essential for accurate sign production, it was necessary to take special care and time in

writing/rewriting these descriptions, so that the naive signer could follow instructions easily and so that the text and graphics did not provide conflicting information.

In like manner, the word definitions needed to be written carefully, adapting the dictionary definitions to ones which were both more easily readable and more meaningful. In many cases, the standard dictionary definition provides no clarification at all of a word's meaning, especially for the person who has no initial idea of its meaning and who has a fourth grade reading level or below. For example, one dictionary's definition of "us" is "the objective case of we; the dative case of we"; one definition of "account" -- "a statement of pecuniary transactions" (Random House, 1967). Several different dictionaries were consulted, including: Scott, Foresman Beginning Dictionary, Beginner's Dictionary of American English Usage, Everyday American English Dictionary, and NTC's Dictionary of American Slang and Colloquial Expressions. The definition used for each word was then an adaptation or simplification of the most reasonable definition.

The sample sentences were written both to be relevant for deaf adults in the workplace or community and to be easily read and understood by adults who might have a reading level of 4th grade or below. The sentences were composed to provide meaningful context for adults using the words, either in workplace, home, or community situations. An attempt was also made to provide contextual clues about the word's meaning from the sentence itself. (e.g., "How much money do I need for the trip?" or "He drinks two cups of coffee before work.")

In cases where words had dual (or many more) meanings, the meanings chosen for definition and for sample sentences were those which most closely corresponded to the ASL sign meaning. The "finish" of a job, for example, is not at all the same ASL sign as that for the "finish" on a table; and the "full" which means "complete" is entirely different from the "full" which results from eating too much. In the case where both signs and both meanings were relevant (e.g., with "full"), both were included on the same data stack and were numbered to show which definition and which sentences belonged to the corresponding ASL sign. In cases where the second or third meanings were much less common or were irrelevant for the purpose of this project (e.g., the finish on a table), these meanings were deleted from the file altogether.

Data Entry and Editing of the Data File

Both graphic and alphanumeric data were entered for each "card" of the dictionary -- including the word, the sign illustration, description of sign production, definition, picture of word, and sample sentences.

Graphic data were scanned as line art, using AppleScan, with a resolution setting of 75 dots per inch and a contrast threshold of four. First, a preview scan was made, after which an image of the scanned material appeared on the computer screen in the scanner panel. The graphic material was then cropped to exclude extraneous background material from being in the final scanned image -- a space-saving technique. Next, the resulting image was "cut" from the AppleScan display and "pasted" in the appropriate field of the corresponding card in the Hypercard stack. Once the information was

in the Hypercard stack, edits such as clarifications, erasures, or change in design were made.

The corresponding text was then entered onto the card directly from the keyboard. Revisions of text and second revisions of graphics were sometimes necessary, following the review process by the sign language experts and the text editors.

Chapter IV

The Product: A Data File of Workforce Signs and Vocabulary

IV. THE PRODUCT -- THE COMPUTER DATA FILE

Product Description

The product resulting from this 353 project is an extensive computer data file of vocabulary relevant for deaf adults in the workplace and in daily living situations, and for their co-workers, employers, and community contacts. It provides a series of written words and phrases relevant in these contexts, along with illustrations of the appropriate ASL signs, a description of how to make these signs, line drawings illustrating the word itself, definitions, and sample sentences of the words or phrases in adult workplace, community, or daily living situations. Also included, where appropriate, are sign language synonyms, alternate words for which the pictured ASL sign is also an accurate representation.

The exact fields in this computer file are listed below, along with the field labels (in quotes) which are printed both on the screen and in the hard-copy print-outs. These are:

(1) the **word** or phrase itself (no label);

(2) the **sign illustration** (no label);

(3) the sign synonym -- **"Same Sign for"**;

(4) description of sign production -- **"Description"**;

(5) pneumonic hints or sign's origin --**"Hints/Origin"**;

(6) **picture** representing meaning of word (no label);

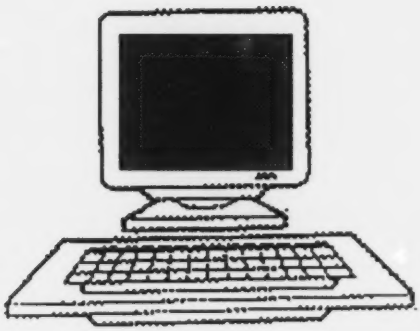
(7) definition of word or phrase --**"Definition"**;

(8) sentences using word/phrase --**"Sample Sentences"**

(9) **category** -- hidden field for sorting only.

The sign illustration and picture are graphic fields; all others are text fields. Sample pages are included in Figures 1 through 4.

Computer



Same Sign for:

Description: Hit thumb of right "C" hand on back of wrist of left arm. Bounce "C" twice moving up left arm.

Definition: (noun) An electronic device which can be instructed to do mathematics and other things with numbers and words.

Sample Sentences:

- The computer makes writing fun!
- The computer corrects my spelling errors.
- All the data will be put into the computer.
- I like to type on the computer.

Common Signs, Computers

Figure 1. Sample Page from Data File

* Busy

Same Sign for:

Description: Start with right hand in "B" shape, palm out, fingers pointing up. Brush from side to side on wrist of left hand, palm down.

Hints/Origin: "B" hand in "work" sign position.

Definition: (adjective) having a lot to do; doing something already; doing many many things

Sample Sentences:

- The boss is a busy person.
- The mall is always busy before Christmas.
- He was busy studying for the test.
- If you are too busy today, finish it tomorrow.

Common Signs

Figure 2. Sample Page from Data File

* **Money**

Same Sign for: Financial, Economic

Description: With right hand in "and" shape, palm up, and with left hand open, palm up, tap back of right hand on left palm several times.

Hints/Origin: Suggests putting money in palm of hand.

Definition: (noun) coins and paper bills

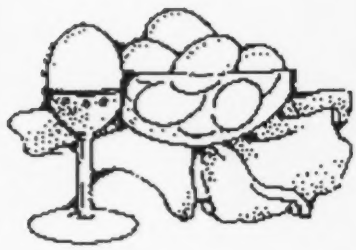
Sample Sentences:

- How much money do I need for the trip.?
- This store makes a lot of money.
- Count the money in the cash register.

Bank/Money, Size/Shape/Quantity, Supermarket

Figure 3. Sample Page from Data File

Egg



Same Sign for:

Description: Strike the right "H" fingers across the left "H" fingers, palms facing body, dropping them down and away from each other.

Hints/Origin: Breaking an egg into a bowl.

Definition: (noun) the contents of a hen's egg used for food; a round object with a hard shell, produced by a female bird (The egg is broken open, and the contents are used for food.)

Sample Sentences:

- I'll have scrambled eggs please.
- I ordered coffee, juice, and eggs.
- I want bacon and eggs.

Fast Food/Restaurants, Supermarket

Figure 4. Sample Page from Data File

Currently, 500 fully expanded sets of signs and concepts are included in the data file, with each card in the stack including data in at least 7 of the above fields. (For some signs, no "hints or origins" could be included; and for some words, the "picture" has yet to be entered.) In addition, the data file includes 2 cards with illustrations of the fingerspelled version of the 26 letters of the alphabet and 6 cards containing 36 key numbers.

The sign/concept cards are classified into one or more of 28 categories. Some of these categories include common or general signs, needed by almost any person interacting with deaf adults; some are more specific to the employment situation, to specific jobs, to community interactions, or to daily living situations. Because there is also considerable overlap among these broader areas of classification, the categories are listed alphabetically below, along with the number of "cards" (sign/concepts) included in each and the actual number of words or phrases (including sign synonyms) which this represents in each category.

Categories	Cards	Words
Adult Day Care	22	48
Around the House	35	49
Bank/Money	11	13
Colors	12	12
Common Phrases	17	19
Common Signs	104	176
Computers.	20	34
Containers/Utensils	12	13
Desserts/Snacks.	10	14
Directions/Reinforcement	26	51
Drinks	11	16
Family Relationships	20	22
Fast Food/Restaurants.	41	59
Feelings	16	36
Fruits/Vegetables.	25	30
Health/Hospital.	49	85
Holidays	8	9
Interview/Forms.	57	96

Mail Room.	24	38
On the Job	63	121
People	17	22
Police	20	30
Pronouns	12	24
Questions.	15	18
Safety/Survival.	34	71
Shape/Size/Quantity.	6	13
Supermarket/Convenience Store.	62	86
Time/Schedule.	27	41

Because of the flexibility of a computer data file, any of the above categories may be expanded, and entirely new categories may be added as needed. An alphabetical listing of all 500 individual sign/concept entries, according to primary word or "title" of the card is presented in Appendix A. A second listing there includes an alphabetical listing of the "sign synonyms", the 282 alternative words which may also be accessed through this databank. A series of 28 listings of "words by category", is then included in Appendix B. A hard copy of the entire data file, along with directions for use, is provided in a separate booklet; along with copies on disk.

Of the 500 data stacks developed for individual sign/concepts, 105 have pictures to further demonstrate the meaning of the word. Another 14 entries have two different sign illustrations on the same "card", either because words which are homonyms in English have two entirely different signs for the two meanings [e.g., "right" (direction) vs. "right" (correct)] or because there are two commonly used signs for the same word (e.g., "where" or "sister").

A sampling of three current sign language books (Humphries et al, 1988; Reikof, 1979; & Butterworth, 1083) shows that between 1200 and 1800 signs are included -- an indication of the number of commonly used signs considered important for broad dissemination. This computer data file, with much greater flexibility, thus has

entries for approximately one-fourth to one-third of these commonly used signs, and it does provide an especially comprehensive listing of those relating to the workplace and community.

Print-Out Options:

The sign illustrations, descriptions, definitions, pictures, and sentences within this computer data file may be printed out in a number of different combinations, depending on intended use. The number of different words/concepts per page will also vary, depending on the number of information fields to be accessed. Again, the optimum number per page will depend upon intended use, as discussed under "User Options" below. The possible combinations of fields which may be printed out at the present time, and the number of concepts/signs per page which any combination will allow, are listed below, with examples of each in Appendix C. Additional options, with more signs per page are being programmed now.

PRINT-OUT COMBINATIONS	# PER PAGE
Graphics (Sign + Picture) Included: *	
1. Graphics + (written) Word	3
2. Graphics + Word + Description + Hints	2
3. Graphics + Word + Definition	2
4. Graphics + Word + Description + Sentences	1
5. Graphics + Word + Description + Definition	1
6. Graphics + Word + Definition + Sentences	1
7. Graphics + Word + Sentences	1
8. All options included	1
Sign Illustration Not Included:	
1. Word Alone	10
2. Word + "Same Sign"	10
3. Word + Definition	7
4. Word + Definition + Sentences	2
5. Word + Sample Sentences	3

*Note: The option for "Sign Only" is being programmed. When it is complete, 6 sign illustrations can be printed out per page.

Potential Product Use / User Options:

The data file may be accessed by the user either directly on the computer or by making/using hard copy print-outs in any of the combinations listed above. The user may request to view or to print out all cards within a particular category or may select any of the specific word/concept/signs within the data file. If the print-out option is selected, the user must then indicate the number of fields which he/she wants to include on each page.

It is anticipated that persons with several types of involvement or connections with deaf adults will want to use this data file, including: (1) workforce literacy instructors and job coaches; (2) normally hearing co-workers, supervisors, and employers of deaf employees; (3) community members who come in contact with deaf persons (e.g., in hospitals, banks, supermarkets); (4) instructors of deaf adults in literacy and other adult education classes; and (5) deaf/hearing-impaired adults themselves.

The options provided for these different groups through the computer data file are discussed below.

(1) **Workforce Literacy Instructors and Job Coaches** can use this Hypercard stack, with its capacity to create immediately relevant and tailor-made "mini-dictionaries, to facilitate effective communication and understanding on the job -- helping each of their deaf clients and his/her co-workers as they share in a mutual learning process. The instructor can select key components from the data file which relate specifically to each clients's current job and to job-related community and daily living needs and then select a corresponding set to use with the client's co-workers and

supervisors. The instructor can then print out key vocabulary with sign illustrations, descriptions of sign production, and pneumonic hints for the hearing co-workers, and print out the same signs, with content expansions, pictures, definitions, and sample sentences for the deaf adult. The instructor can make multiple copies of one mini-dictionary for sign language classes at any one job site and can also make an expanded corresponding copy for the deaf client him/herself.

(2) For these **hearing co-workers and supervisors** of the deaf employee, the data file can be used to continue enhancing communication on the job once the literacy instructor or coach is no longer at the site. If the employer has a Macintosh computer (common in many workplace situations) and has a copy of this data file, any employee at the site can print out the ASL signs especially needed for daily or emergency communication with his/her deaf co-workers. The file can also be used for quick reference and review within the workplace, supplementing and reinforcing sign language classes.

For example, the co-workers and employers/supervisors of almost all deaf employees can benefit from general sign-sets from the databank, such as "Common Signs", "Common Phrases", and perhaps "Feelings, "Questions" or "Size/Shape/Quantity", as well as general job-related sign sets, such as "On the Job", "Directions/Reinforcement", and "Time/Schedules". Other signs needed by these workplace colleagues will depend upon the specific job site -- e.g., those in Giant Eagle or Shop & Save can benefit from the "Supermarket" signs; those in Burger King, McDonald's, or Eat and Park from "Fast

Foods/Restaurants"; and those in the Post Office from "Mail Room". In emergency situations, any of these employers may need "Safety/ Survival" signs or even the "Health/Hospital" set.

(3) **Community Members**, in like manner, can use this data file as a ready reference for signs needed in communicating with deaf customers and service recipients -- preferably in combination with "live" sign language classes in the community. In particular, community agents such as hospitals, police, and banks can use the sign illustration and production hints included in the data file under "Health/Hospital", "Police", "People", and "Banks/Money". These particular topics were included at the request of community members in each of these areas, who also have participated in several sign language classes taught by the literacy instructor at the WPSD Center. Additional topics relevant in the community include: "Supermarket", "Fast Foods/Restaurants", and "Mailroom".

(4) For **instructors of deaf and hearing-impaired adults** in literacy classes across the Commonwealth and nationwide, this data file can be especially useful in allowing instantaneous retrieval of vocabulary and expansions needed at the time of any lesson. This use is in addition to the job-site literacy training discussed above. Within the literacy classroom, the data file can be used either by the teacher -- to help demonstrate the connections between the known ASL signs and the written words, definitions, and functional sentences -- or by the students themselves, for vocabulary exploration or a guided reading lesson set up by the instructor. Through exploration and practice with the various data cards, either on the computer screen or through computer print-outs, the

deaf students will be better able to see and internalize the correspondence between the ASL signs and written words, and subsequently will be able to use these words with greater confidence in daily living, work or community situations.

The literacy instructor can also use the vocabulary cards developed through this project to help students read stories or articles specifically composed to help clarify workplace, community or daily living situations which might arise. For example, to demonstrate vocabulary needed for situations involving an interview, the instructor might write a story about a deaf person going to interview for a data entry job at the local post office. Within the story, the deaf student would need to read and understand key written vocabulary such as "certificate", "experience", "data processing", "information", and "terminal" -- vocabulary which he would, in fact, need to use later, to read, write, or use in actual interview or job situations. This vocabulary, which is already in the Hypercard data file, under the "Interview" and "Computer" categories, can easily be retrieved by the reader, as needed.

Using the same scenario, the teacher also can encourage a variety of role-playing and "role-writing" options -- having each student use his/her new interview and job-related vocabulary to write sample applications to a variety of potential employers, while also practicing use of this vocabulary in mock interview or job situations. The student can use the computer him/herself to retrieve the needed vocabulary and will be motivated to read and write, both by the relevancy of the material to his/her everyday needs and by the allure of this computerized medium, which provides

both text and graphics at the same time.

(5) **The deaf/hearing-impaired person** him/herself can use and benefit from this data file in any of the many ways described above -- through job-site literacy training, in adult literacy classes, and through interactions with co-workers and community members who are becoming more able to use at least some basic signs to ease communication in the workplace and in community sites. In particular, this data file will help deaf adults to enrich their vocabulary by "playing" with the words and signs, exploring combinations and options on the computer, hypothesizing about a word's meaning and then checking it with the graphic illustration of the corresponding ASL sign.

It should be noted that this "playing with words" and "playing with sounds" is one of the earliest and most effective language-learning strategies, used spontaneously by very young children. Because deaf babies do not hear a language, they do not spontaneously play with its sounds (although they may play with the sign equivalent); they do not have fun exploring the spoken language of their community, and are therefore faced with a critical barrier to learning the English language. One potential advantage of this Hypercard data file is that it gives deaf adults an opportunity to play with the English language in a different way -- on the computer screen -- and thus it may very well prove to be an effective literacy tool for these individuals, and subsequently to their children and families.

Deaf adults themselves were major contributors in generating the content for the computer data file designed for this project. Participants in the adult literacy programs at the WPSD Center frequently request additional vocabulary assistance, in particular with work-related concepts, with special terms used in banking, hospital, and transportation situations, and with reading written labels and instructions/directions at home, in restaurants, and in grocery, department, clothing and discount stores. To the extent possible in the time available, the vocabulary for the data file was selected to met the needs of these deaf clients. ("Transportation" and "Clothing", two areas which could not be completed, are scheduled for addition to the data file within the near future.)

Evaluation:

The evaluation of this project, and of the product which was its primary goal, has been a sequential process, one which will continue as use of the completed data file expands.

The specific sub-objectives each represented a step toward the final product, moving from the design of a data entry process through the composition and entry of the graphic and text information, and on to production of the proposed data file. Because the satisfactory implementation of each one of these objectives was essential for completion of the computer data file, the successful production of that file is the ultimate measure of the success of each objective. Thus, in accordance with sub-objectives A through D, and as described in more detail in Chapter 3, the following steps were achieved:

(1) A data entry process was designed which provided the means for establishing the entire data file -- the words, the signs, descriptions, hints, definitions, pictures, and sentences. Subsequently, a data retrieval process was designed, providing user access to these data.

(2) A comprehensive set of over 500 words and phrases was identified as critical for communication between deaf employees and their co-workers and for community interactions involving deaf adults. Entry pages for these words/concepts were then developed via the steps below.

(3) Illustrations of the ASL signs for the selected words were created, along with illustrations for the objects and actions represented by these words and signs; and the resulting graphics were entered into the Hypercard stack.

(4) Text definitions, descriptions, hints on sign production, and sample sentences were composed for each of the selected concepts, and then entered in the data file.

In the process of implementing these first four sub-objectives, several evaluation measures were used at each step of the way, to assure the accuracy and effectiveness of the data entries. As noted in Chapter 3, each of the sign illustrations and each of the accompanying descriptions were checked by at least two experts in sign language, including one who is profoundly deaf and a native user of ASL; and consistency between the sign illustration and its description was further checked by the Project Coordinator. Each definition and each sentence were also checked by at least two persons, both for accuracy of meaning and for ease of reading comprehension.

In addition, once a sufficient number of data cards had been entered in the file and were retrievable in hard copy, the literacy coordinator made copies of the pages in categories such as "Common Signs" and "On the Job" and used them as part of five different sign language classes which she was teaching at the time. A useability check by potential users of this file -- the 75 normally-

hearing members of these sign language classes -- was therefore possible, especially for evaluating the clarity of the sign illustrations and of the accompanying hints and descriptions. Reactions by these "evaluators" to the information offered was very positive; and the signing practice opportunities which the sheets provided proved effective in the learning process. The only negative comments made by this group referred to a lack of graphic clarity in some of the computer print-outs of the signing hands. This feedback, in turn, was used to refine the data entry process; and all of the illustrations were further clarified to prevent confusion. In fact, the on-going evaluations have resulted in a continual process of graphic and text refinement, helping to assure a maximally useable data file.

The culminating goal of this project was the production of a functional, highly accessible, and individualized data file, which would allow the user or instructor to tailor his/her data requests to fit the unique needs of each workplace, each community, and each deaf/H-I adult. This data file has been produced, and it does contain each of the features projected in the original proposal. Because only one print-out option (the full page) was possible until this November, and because the entries in the data file were being refined all through the production and evaluation process, a full evaluation of the completed file has yet to occur. However, this data file will be a part of the WPSD Center On Deafness adult and workforce literacy classes for over 40 deaf adults in 1991-92, and to over 200 normally hearing participants in communication classes taught by the Center. This usage will provide an optimum oppor-

tunity for evaluation of the completed file, which will be conducted as part of these classes. In the meantime, the sequential evaluations of the product-in-process have helped to assure a data file that is accurate, easily accessible, and immediately useable.

Distribution:

As noted on page 7, the disks produced will be distributed to the Office of Adult Basic and Literacy Education for interested users to borrow and copy. The project is designed to be of paramount interest to literacy providers who work with hearing-impaired individuals, but it is anticipated that other special literacy populations -- as well as employers and community members interacting with deaf adults -- may well find value in this product.

To further educate potential users about the existence and parameters of this data file, an article will be written for "What's the Buzz?", the Pennsylvania Adult Literacy newsletter; and information on the file will be disseminated at the Annual Literacy Conference of PAACE in February, 1992. At least one article will be written for professionals in deafness in a journal or newsletter with national distribution. Sample "mini-dictionaries" will also be printed for distribution and display.

Chapter V

Conclusions and Recommendations

V. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This project has succeeded in its stated goal of Developing a Computer Data File: Signs, Illustrations, and Vocabulary for Use with and by Hearing-Impaired Adults. For ease of reference, the resulting data file will be called: "Workplace Concepts in Sign and Text". This file offers a unique, relevant, motivating, and highly adaptable tool for literacy instruction with deaf adults and for teachers/students of basic sign language use, not only in Pennsylvania but nationwide. The flexibility of such a file offers numerous opportunities for individualized use, enhanced by its open-ended capacity -- the ability to add new words or categories whenever needed.

In accordance with the project objectives, key vocabulary was identified of special relevance for deaf/H-I adults in the workplace, and for their normally hearing co-workers. A Hypercard stack of individual vocabulary "cards" was then established, providing expanded information on each of over 500 vocabulary entries. Graphic fields were included, providing an illustration of the ASL sign representing each word or concept, and also a picture of the object or action represented. Text fields were then added, with a description of the sign, the identification of alternate words expressed by the same sign, a definition of the word(s), and sample sentences using the word or phrase.

The resulting data file, now complete and ready for use, contains over 500 concept cards, plus the manual alphabet and basic number signs. Each vocabulary item, with its corresponding sign

illustration, picture, and text information, may be accessed in an almost infinite number of combinations, tailor-made to fit the needs of each individual user.

Recommendations:

The completed data file can be used both in sign language classes for normally hearing persons who will be interacting with deaf/H-I individuals and in literacy classes for deaf adults. The file is intended primarily as a practice tool and as a reference or reinforcement measure, to be used in conjunction with these "live" sign language classes and with literacy instruction. With its flexibility and capacity for individualization, "Workplace Concepts in Sign and Text" should prove to be of significant benefit for a great variety of users -- for literacy instructors, for deaf/H-I individuals, for employers and co-workers of deaf employees, and for community or family members wanting to learn how to sign.

Modifications or additions to the Hypercard stack can now be made, or the file can continue to be used "as is", serving as an educational tool for adults both hearing and deaf. With the addition of sentences and categories more relevant or appealing for a younger audience (e.g., "Animals", "Toys and Games", and "Clothing") this file can also be a tool in the education of deaf children.

In fact, any individual who has access to a Macintosh computer can use this program and can add to it according to the needs of his/her clients, students, or other participants. The Hypercard

program is included as a part of the Macintosh computer, allowing providers to add on any new text material (e.g., sample sentences or definitions) with ease. New illustrations of signs or words can also be added, using any of a number of computer software "paint" programs, such as "MacPaint". The open-ended capability of this program will allow for even greater individualization of the literacy training and for broader use by literacy providers.

In the future, it is recommended that new versions of this data file be produced, including: (1) the addition of an animation feature to the sign language illustrations (providing movement to the sign), and (2) the addition of the capacity to call forth the sign illustrations from the data-file dictionary into text that is being read or written by the deaf or hearing user (providing immediate confirmation of the word's meaning or of the appropriate sign). The addition of such options will require considerable time -- for composition and illustration, for programming, for entry, and for editing. However, the computer capacity is available now to incorporate these extra features. A new project, developing an animated Version II and III of this data file, could prove to be a very exciting, motivating, and educationally beneficial addition -- a new chapter in literacy instruction.

References

REFERENCES

Allen, E. (1986). Patterns of academic achievement among hearing-impaired students: 1974 and 1983. In A. Schildroth & M. Karchmer (Eds.), Deaf Children in America (pp. 161-206). San Diego, CA: College-Hill Press.

Bahan, B. & Dannis, J. (1987). Signs for Me: Basic Sign Vocabulary for Children. Berkeley, CA: Dawn Sign.

Bornstein, H. & Saulnier, K. (1983). Comprehensive Signed English Dictionary. Washington, DC: Gallaudet University Press.

Butterworth, R. (1983). The Perigree Visual Dictionary of Signing. New York, NY: Putnam Publishing Group.

Collins, P. H. et al (1989). Beginner's Dictionary of American English Usage. Lincolnwood, IL: National Textbook Co.

Costello, E. (1983). Signing: How to Speak with Your Hands. New York, NY: Bantam Books.

Fant, L. (1983). The American Sign Language Phrase Book. Chicago, IL: Contemporary Books, Inc.

Governor's Policy Office. (1988). Two Estimates of Pennsylvania's Hearing-Impaired Population. (Report by PA Office of Deaf and Hearing-Impaired). Harrisburg, PA: Governor's Policy Office.

Humphries, T., Padden, C., & O'Rourke, T. (1988). A Basic Course in American Sign Language. Silver Springs, MD: T.J. Publishers, Inc.

Lane, L. (1987). The Gallaudet Survival Guide to Signing. Washington, DC: Gallaudet University Press.

Newell, W. (1983). Basic Sign Communication: Vocabulary. Silver Spring, MD: National Association of the Deaf.

The Random House Dictionary of the English Language. (1967). New York, NY: Random House.

Riekof, L. (1979). The Joy of Signing. Springfield, MO: Gospel Publishing House.

Spears, R. (1990). Everyday American English Dictionary. Lincolnwood, IL: National Textbook Company.

Spears, R. (1989). NTC's Dictionary of American Slang and Colloquial Expressions. Lincolnwood: IL: National Textbook Company.

Thorndike, E. L. & Barnhart, C. L. (1983). Scott, Foresman Beginning Dictionary. Glenview, IL: Scott, Foresman & Co.

REFERENCES CONT.

Trybus, R. J. & Karchmer, M. (1977). School achievement scores of hearing-impaired children. American Annals of the Deaf, 122:2, pp. 62-69.

Appendix

A. Alphabetical Listings of Data File Entries
    1. Initial Words
    2. Sign Synonyms
B. Categorical Listing of Data File Entries
C. Sample Print-Out Options
D. Vitae

Appendix A.
Alphabetical Listings of Entries in Data File

1. Initial Words and Phrases
2. Sign Synonyms

1. Initial Words and Phrases in Computer Data File

A Few

A Lot

Abortion

Absent

Accept

Accident

Account

Add

Address

Afternoon

Again

Alarm

All Night

Always

Ancestors

Answer

Appear

Apple

Application

Appointment

Area

Arrive

Ask

Aunt

Awful

Back

Bacon

Bad

Bake

Banana

Bathroom

Be Careful

Beans

Bed

Bedroom

Before

Best

Better

Beverage

Black

Blue

Body

Book

Born

Boss

Bother

Bottle

Bowl

Box

Boy

Bread

Break

Breath

Bring

Brother

Brown

Build

Bury

Busy

Cabbage

Cake

Can

Can't

Cancel

Capture

Car

Card

Carrot

Catch

Ceiling

Certificate

Chair

Change

Check

Cheese

Cherry

Chicken

Child

Children

Chocolate

Choose

Christmas

Clean up

Closet

Coconut

Coffee

Coke

Cold

Color

Come

Computer

Confused

Cookie

Copy

Corn

Count

Cousin

Cream

Cry

Cup

Customer

Cut

Damage

Danger

Data

Data Base

Data Processing

Daughter

Day

Deaf

Defend

Delete

Department

Dessert

Dictionary

Die

Dining Room

Dish

Doctor

Dollar

Don't Know

Don't Like

Don't Mind

Don't Understand

Don't Want

Door

Drawer

Dream

Drink

Dumb

Easter

Eat

Egg

Electric

Elevator

Embarrassed

Every Day

Excuse Me

Experience

Expert

Explain

Explode

Face

Faint

Family

Fast

Father

Feel

Field

Fight

Fine

Finish

Fire

Fish

Fix

Floor

Flower

For

Fork

Fourth of July

Freeze

French Fries

Friday

Friend

Fruit

Frustrated

Full

Girl

Give

Glass

Go

Go to it

Go With

Good

Good Morning

Goodbye

Grandfather

Grandmother

Grapes

Gravy

Green

Gun

Hair

Hamburger

Hands

Hanukkah

Happen

Happy

Hard

Hard of Hearing

Have

He

Hearing

Hearing Aid

Heart

Heart Attack

Heartbeat

Heavy

Hello

Help

Here

Himself

Hire

His

Hit

Hold

Holiday

Home

Hospital

House

How

How Are You

How Many

How Much

Hungry

Hurry

Hurt

Husband

I

I'm Fine

Ice

Ice Cream

Idea

Important

Improve

In

Indian

Information

Inside

Interpret

Interpreter

Interview

Jelly

Job

Judge

Juice

Key

Kid

Kill

Kitchen

Knife

Know

Last

Late

Later

Learn

Leave

Left

Lemon

Letter

License

Like

Line

Lipread

List

Live

Living Room

Lock

Long Time

Look

Lose

Machine

Mad

Magazine

Mail

Make

Man

Many

Marry

Match

Mean

Measure

Meat

Medicine

Meet

Meeting

Mexico

Middle

Milk

Monday

Money

Month

Mop

More

Morning

Mother

Movie

Must

My

My Name Is

Name

Napkin

Need

Nephew

Nervous

New Year

Newspaper

Next week

Nice

Niece

Night

No

Noon

Not

Not Yet

Now

Number

Nurse

Office

Oh I See

Onion

Operation

Orange

Order

Our

Out

Owe

Pack

Paper

Parents

Past

Patient

Pay

Pay Attention

Peach

Peanut

Pear

Peas

Pencil

People

Person

Picture

Pie

Pill

Pineapple

Pink

Pitcher

Plan

Plant

Plate

Please

Pneumonia

Poison

Police

Pop

Potato

Practice

Prefer

Pregnant

Prepare

Price

Prison

Problem

Program

Project

Proud

Pumpkin

Punish

Purple

Put

Put Down

Question

Read

Receive

Red

Refuse

Relatives

Remember

Report

Require

Right

Room

Sad

Salad

Salt

Sandwich

Saturday

Sausage

Save

Schedule

Secret

See

See You Later

Sell

Send

Shape

Short

Shot

Show

Sick

Sign

Signature

Sister

Skill

Sleep

Slow

Small

Smell

Smoke

Son

Sorry

Spain

Spoon

Start

Steal

Stop

Strawberry

Subtract

Sugar

Summarize

Sunday

Supervise

Survive

Sweep

Table

Talk

Talk With

Tall

Tan

Tea

Telephone

Terminal

Test

Thank You

Thanksgiving

Their

They

Think

Thursday

Ticket

Time

Tired

Toast

Today

Tomato

Tomorrow

Total

Towel

Try

Tuesday

Twins

Type

Uncle

Understand

Until

Upset

Vacuum Cleaner

Valentine's Day

Vanilla

Vegetables

Vomit

Wait

Wall

Want

Warning

Wash

Water

Watermelon

We

Weather

Wednesday

Weekly

What

What For

What Time Is It

What's Up

When

Where

Which

White

White Person

Who

Why

Wife

Window

With

Woman

Work

Write

Wrong

Yearly

Yellow

Yes

Yesterday

You

Your

Alphabet (A - M)

Alphabet (N - Z)

Numbers (0-5)

Numbers (6-11)

Numbers (12-17)

Numbers (18-23)

Numbers (24-60)

Numbers (70 +)

2. Listing of "Sign Synonyms" in Computer Data File

LISTING OF SIGN SYNONYMS IN DATA FILE

(Alternative Words which can be accessed under "Same Sign For:")

A:

ability	accompany	ache
adapt	admire	after awhile
ago	aid	all day
already	alter	angry
annual	apologize	appearance
appropriate	arrange	arrest
assist	attempt	

B:

battery	begin	berry
bird	biscuit	bologna
bomb	breathe	brochure
broom	burn	business

C:

can	captain	careful
catalog	catch	caution
center	central	chairman
chief	chilly	clean
Coco-Cola	competent	condense
confidential	confusion	constantly
contain in	converse	cop
corn on the cob	correct	cost
criticize	cross	

D:

daily	dangerous	daydream
dead	death	deletion
demand	demonstrate	depart
descendants	describe	desire
desk	destroy	difficult
disease	don't care	drive
drug		

E:

economic	effort	electricity
end	engine	enjoy
erect	evening	ever
exam		

F:

face	factory	film
financial	food	forgive me
freeze	frost	frozen

Listing of Sign Synonyms in Data File (cont.)

G:

gaze	general	generations
glad	gone	good at
grave	grease	greasy
grouchy	grow	

H:

handkerchief	hand to	have to
health	her	herself
horrible		

I:

ice	ill	imitate
in	infirmary	inform
inform them	inform you	injection
invite	its	itself

J:

jail	jam	joy

K:

knowledge

L:

letter	lettuce	life
little	lock	long time ago
looks	lost	lots

M:

mail	male	manual
me	meaning	medical
meet	melon	Mexican
mine	mixed up	monthly
move	much	murder
must		

N:

Native American	necessary	notebook
notify	not yet	now
numerous		

Listing of Sign Synonyms in Data File (cont.)

O:

observe
officer
oral
outdoors
oven
occur
oil
ought to
outline
odor
one week from now
ours
outside

P:

page
past
peril
plural
preserve
private
protect
pure
pain
patience
photograph
possess
pride
programmer
publishing
pamphlet
penalty
pick
prescription
printing
proper
punch

Q:

quick

R:

rapid
rehearse
reply
rush
rather
remaining
reserve
receive
repeat
respond

S:

sales
seat
several
show
skeleton
small (height)
sorrow
speak
starved
surgery
say
select
she
show up
skilled
soda
sorrowful
speech
steak
sweet
schedule
sense
should
Sign Language
slowly
sore
Spanish
spring
strike

T:

take a pill
textbook
then
toilet
telephone (noun)
theirs
thoughts
train
terrible
them
title
typewriter

Listing of Sign Synonyms in Data File (cont.)

U:

unfortunate us

V:

vacation vacuum

W:

watch welcome What's happening
will will not winter
won't write down

X:

Y:

yours

Z:

Appendix B.
Listing of Data File Entries by Category

Adult Day Care

Bathroom

Be Careful

Cold

Dining Room

Doctor

Eat

Flower

Help

Home

Hungry

Hurt

Magazine

Movie

Newspaper

Nurse

Out

Plant

Sick

Thank You

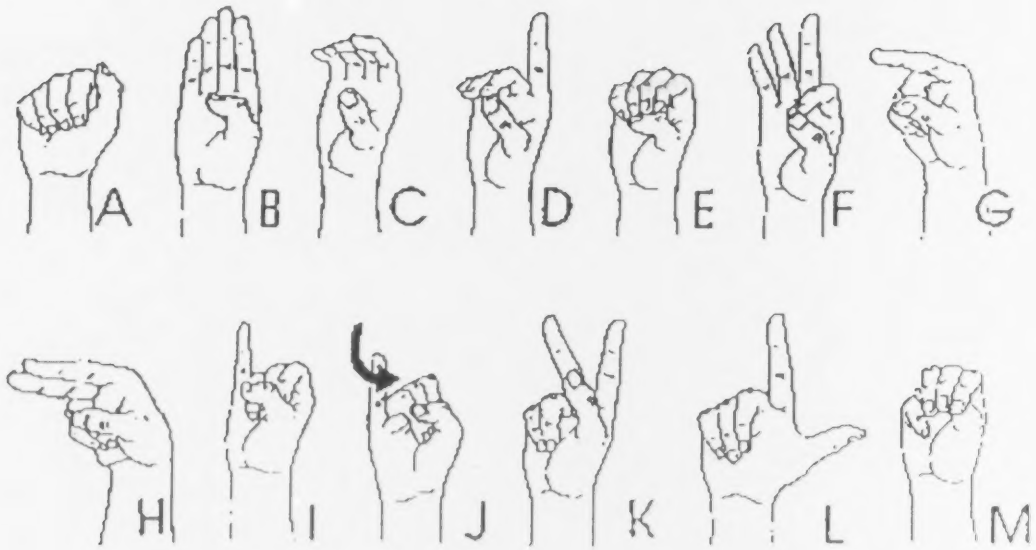
Today

Water

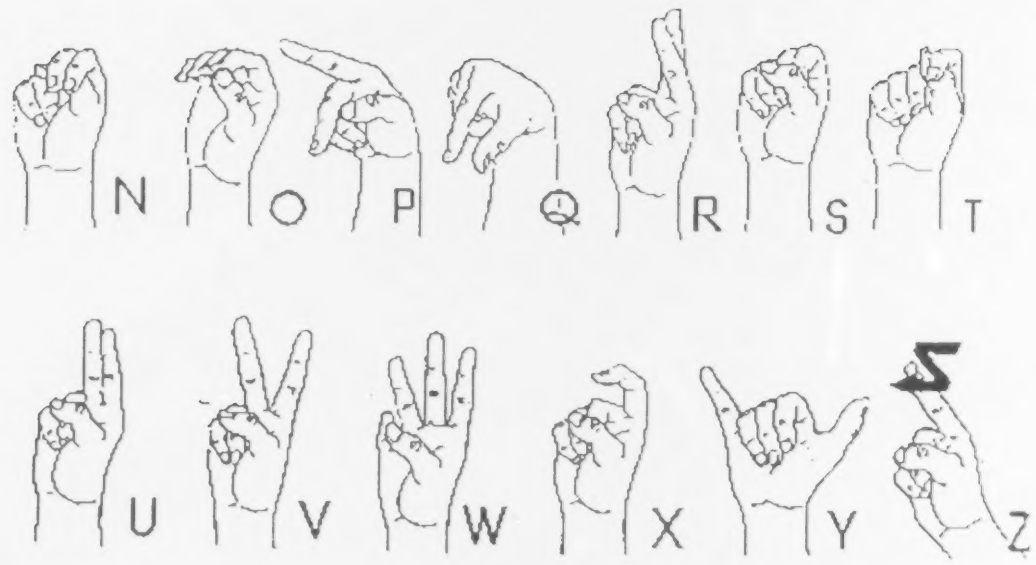
Weather

Alphabet

※Alphabet (A - M)



※ Alphabet (N - Z)



Around the House

Bake

Bathroom

Be Careful

Bed

Bedroom

Build

Ceiling

Chair

Closet

Cut

Dining Room

Door

Drawer

Eat

Fix

Floor

Hold

Home

House

Hurry

Kitchen

Living Room

Make

Mop

Picture

Put

Room

Sweep

Table

Telephone

Towel

Vacuum Cleaner

Wall

Wash

Window

Bank/Money

Account

Add

Check

Count

Money

Owe

Pay

Problem

Report

Subtract

Total

Colors

Black

Blue

Brown

Color

Green

Orange

Pink

Purple

Red

Tan

White

Yellow

Common Phrases

Don't Know

Don't Like

Don't Mind

Don't Understand

Don't Want

Excuse Me

Good Morning

How Are You

I'm Fine

My Name Is

Not Yet

Oh I See

See You Later

Thank You

What For

What Time Is It

What's Up

Common Signs

Absent

Address

Afternoon

Again

Answer

Appointment

Ask

Bad

Bathroom

Before

Book

Boss

Bother

Break

Busy

Can

Can't

Car

Chair

Coffee

Come

Computer

Day

Deaf

Feel

Field

Fine

Finish

For

Friend

Full

Give

Go

Good

Goodbye

Hair

Hard of Hearing

Have

Hearing

Hello

Help

Here

Hire

Home

How

How Many

I

In

Interpret

Interpreter

Interview

Key

Know

Late

Learn

Left

Letter

Lipread

Look

Man

Meet

Meeting

More

Morning

Name

Nice

Night

No

Noon

Not

Paper

Past

Pencil

Please

Prepare

Read

Right

Save

See

Sick

Sign

Sorry

Start

Stop

Talk

Talk With

Think

Time

Today

Tomorrow

Understand

Wait

Want

Where

Who

Why

With

Woman

Work

Write

Wrong

Yes

Yesterday

You

Computers

Again

Computer

Data

Data Base

Data Processing

Delete

Field

Finish

Full

In

Key

Number

Paper

Program

Project

Report

Save

Stop

Terminal

Type

Containers/Utensils

Bottle

Bowl

Box

Cup

Dish

Fork

Glass

Knife

Napkin

Pitcher

Plate

Spoon

Desserts/Snacks

Bake

Cake

Chocolate

Cookie

Dessert

Ice Cream

Jelly

Pie

Sugar

Vanilla

Directions/Reinforcement

Again

Answer

Awful

Bad

Best

Choose

Copy

Dictionary

Explain

Feel

Good

Idea

Improve

Line

Match

Mean

Middle

Practice

Proud

Question

Read

Remember

Right

Summarize

Try

Wrong

Drinks

Beverage

Coffee

Coke

Cream

Drink

Ice

Juice

Milk

Pop

Tea

Water

Family Relationships

Ancestors

Aunt

Brother

Cousin

Daughter

Family

Father

Grandfather

Grandmother

Husband

Marry

Mother

Nephew

Niece

Parents

Relatives

Sister

Son

Uncle

Wife

Fast Food/Restaurants

Bacon

Bake

Beverage

Bread

Cake

Check

Cheese

Chicken

Coffee

Coke

Cream

Dessert

Drink

Eat

Egg

Fish

Freeze

French Fries

Gravy

Hamburger

Ice

Ice Cream

Juice

Kitchen

Milk

Napkin

Nice

Onion

Pay

Pie

Pop

Potato

Salad

Salt

Sandwich

Sausage

Sugar

Tea

Toast

Tomato

Water

Feelings

Cry

Dream

Dumb

Embarrassed

Feel

Frustrated

Happy

Hungry

Hurt

Like

Mad

Patient

Prefer

Sad

Sick

Tired

Fruits/Vegetables

Apple

Banana

Beans

Cabbage

Carrot

Cherry

Coconut

Corn

Fruit

Grapes

Lemon

Onion

Orange

Peach

Peanut

Pear

Peas

Pineapple

Potato

Pumpkin

Salad

Strawberry

Tomato

Vegetables

Watermelon

Health/Hospital

Abortion

Accident

Back

Body

Born

Breath

Cold

Danger

Die

Doctor

Eat

Explain

Face

Faint

Feel

Go

Good

Hair

Hands

Hearing Aid

Heart

Heart Attack

Heartbeat

Hello

Help

Hospital

Hurry

Hurt

Interpret

Interpreter

Judge

Medicine

Name

Nervous

Nurse

Operation

Patient

Pill

Pneumonia

Poison

Police

Pregnant

Problem

Shot

Sick

Sleep

Smoke

Upset

Vomit

Holidays

Christmas

Easter

Fourth of July

Hanukkah

Holiday

New Year

Thanksgiving

Valentine's Day

Interview/Forms

Accept

Address

Application

Appointment

Ask

Before

Born

Boss

Break

Can

Car

Card

Certificate

Children

Department

Experience

Expert

Have

Hire

Holiday

Interpret

Interpreter

Interview

Job

Last

License

Lipread

List

Live

Monday

Morning

Must

Name

Need

Nervous

Office

Picture

Prefer

Problem

Put Down

Send

Sick

Signature

Skill

Slow

Start

Supervise

Telephone

Test

Time

Type

Understand

Weekly

When

Which

Work

Write

You

Mail Room

Area

Box

Check

Count

Cut

Department

Elevator

Give

Important

Information

Inside

Letter

Machine

Magazine

Mail

Newspaper

Number

Office

Pack

Plan

Read

Receive

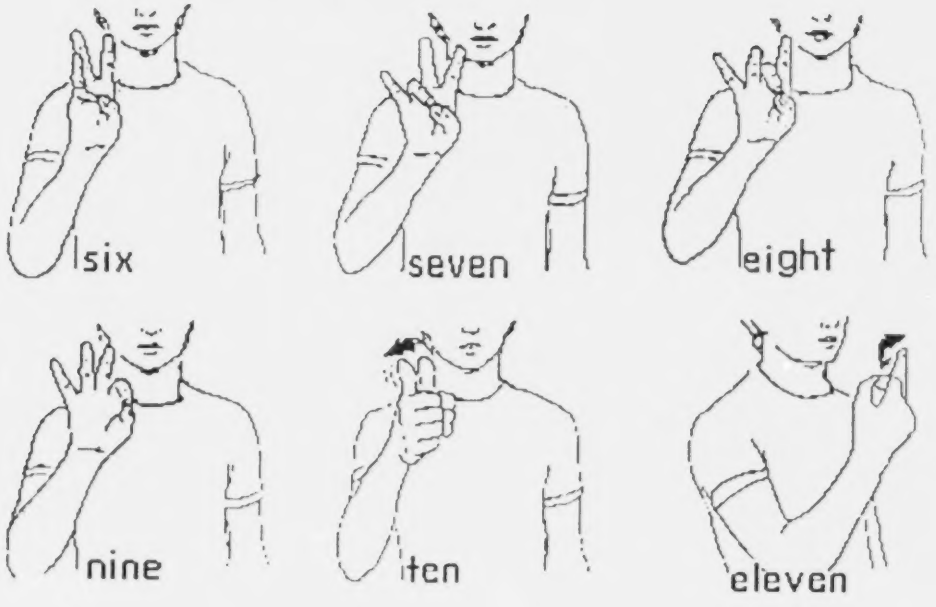
Room

Send

Numbers

* Numbers (0-5)

* Numbers (6-11)



* Numbers (12-17)

twelve

thirteen

fourteen

fifteen

sixteen

seventeen

* Numbers (18-23)

eighteen

nineteen

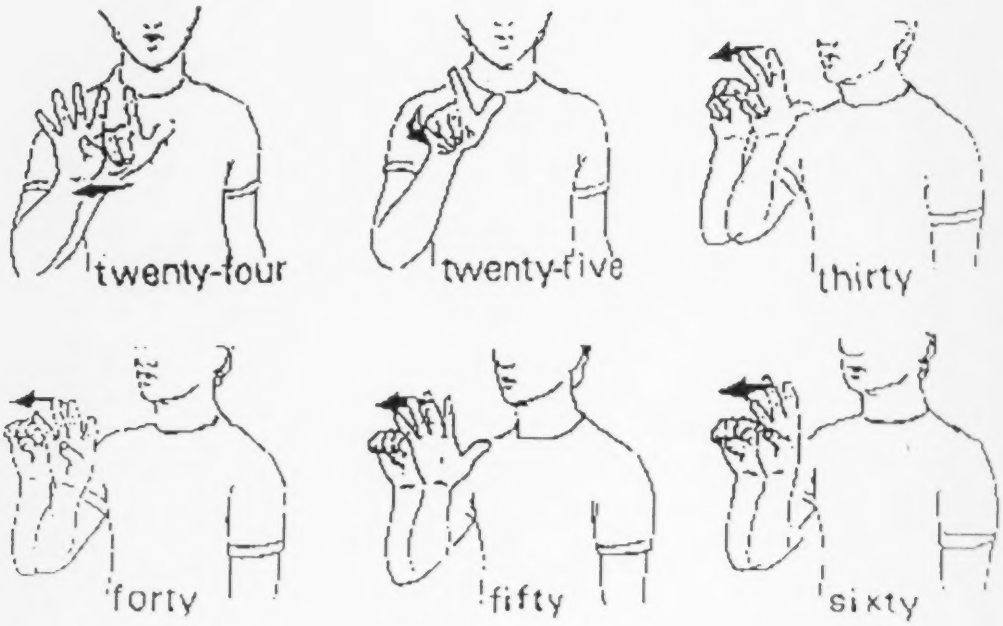
twenty

twenty-one

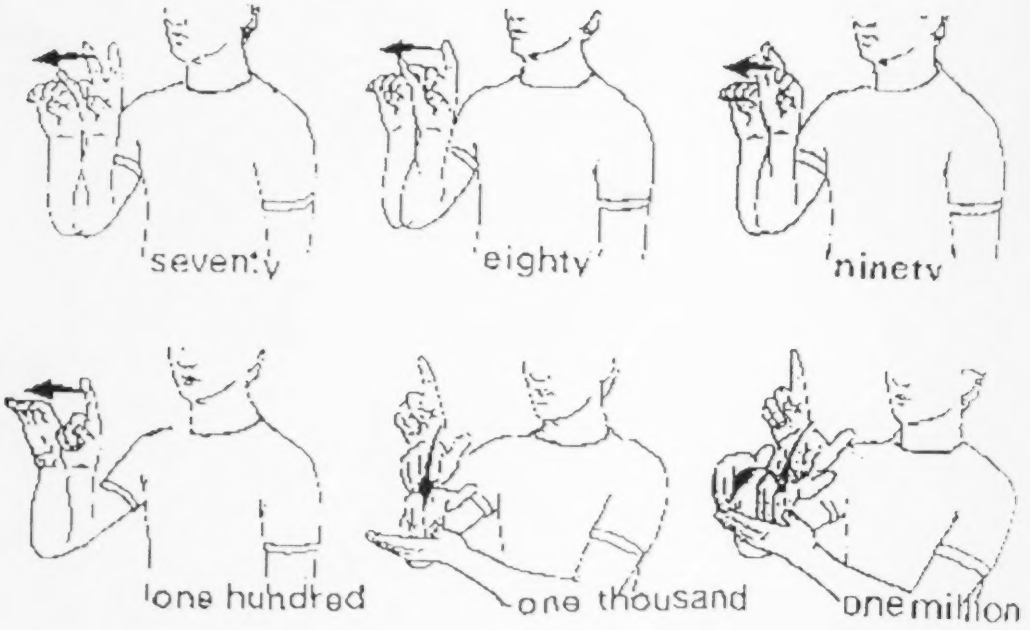
twenty-two

twenty-three

Numbers (24-60)



* Numbers (70 +)



On the Job

Absent

Accept

Again

Ask

Bad

Be Careful

Boss

Bother

Bring

Can

Can't

Cancel

Change

Clean up

Customer

Data

Fast

Fine

Finish

Fix

Go to it

Go With

Good

Hard

Help

Hurry

Interpret

Interpreter

Job

Later

Learn

Lipread

List

Machine

Make

Measure

Meeting

More

Must

Name

Need

Now

Office

Order

Pay Attention

Plan

Practice

Prepare

Price

Project

Put

Refuse

Require

Secret

Show

Slow

Start

Stop

Telephone

Want

Work

Write

Wrong

People

Aunt

Boy

Brother

Child

Children

Friend

Girl

Indian

Kid

Man

Mexico

People

Person

Spain

Twins

White Person

Woman

Police

Capture

Catch

Drink

Fight

Happen

Hard of Hearing

Hello

Judge

License

Lipread

Lose

Marry

Police

Prison

Punish

Question

Relatives

Steal

Telephone

Ticket

Pronouns

A Few

He

Himself

His

I

My

Our

Their

They

We

You

Your

Questions

Answer

Ask

How

How Many

How Much

Question

What

What For

What Time Is It

What's Up

When

Where

Which

Who

Why

Safety/Survival

Accident

Alarm

Be Careful

Bury

Capture

Confused

Damage

Danger

Defend

Die

Electric

Explode

Fire

Gun

Hit

Hurry

Hurt

Key

Kill

Live

Lock

Match

Must

Need

Poison

Punish

Sick

Smell

Smoke

Steal

Stop

Survive

Warning

Wash

Size/Shape/Quantity

Heavy

Look

Shape

Short

Small

Tall

Supermarket

Account

Apple

Bacon

Bake

Banana

Beans

Box

Bread

Cabbage

Cake

Carrot

Cheese

Cherry

Chicken

Coconut

Coffee

Coke

Cookie

Corn

Cream

Customer

Dessert

Egg

Fish

Fruit

Grapes

Hamburger

How Many

Ice Cream

Juice

Left

Lemon

Meat

Milk

Money

Number

Onion

Orange

Order

Owe

Pack

Paper

Pay

Peach

Peanut

Pear

Peas

Pie

Pineapple

Plan

Pop

Potato

Price

Report

Right

Sell

Strawberry

Sugar

Tea

Tomato

Vegetables

Weekly

Time/Schedule

Afternoon

All Night

Appear

Arrive

Break

Change

Day

Every Day

Friday

Late

Leave

Long Time

Monday

Month

Morning

Next week

Saturday

Schedule

Sunday

Thursday

Today

Tomorrow

Tuesday

Until

Wednesday

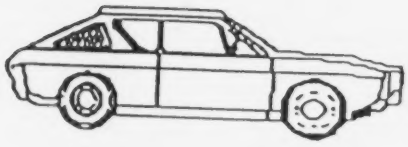
Weekly

Yearly

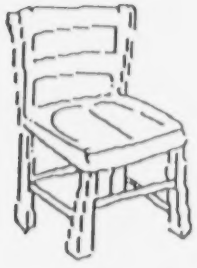
Appendix C.
Sample Print-Out Options

Sample Print-Out
Graphics + Word

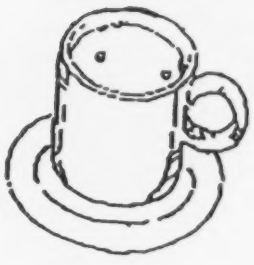
Car



Chair

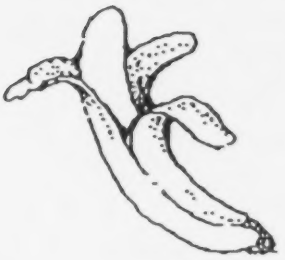


Coffee



Sample Print-Out
Graphics + Word
+ Descriptions + Hint

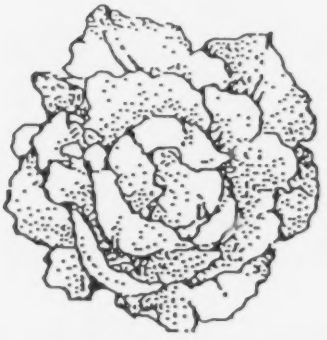
Banana



Description: Move the closed fingertips of the right hand, palm facing outward, down the extended left index finger, palm facing right.

Hints/Origin: Mime peeling a banana

Cabbage

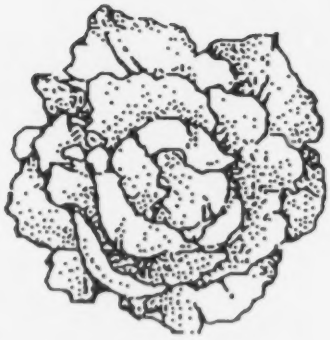


Description: Tap the heel of the curved open hand, palm right, above the right temple.

Hints/Origin: Indicates a head of cabbage or lettuce.

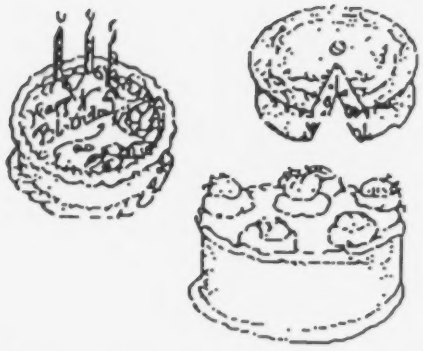
Sample Print-Out
Graphics + Word
+ Definition

Cabbage



Definition: (noun) a vegetable with leaves that grow in a round head.

Cake



Definition: (noun) a dessert made of flour, eggs, and sugar and baked in an oven

Sample Print-Out
Graphics + Word
+ Descriptions
+ Sentences

Learn

Same Sign for:

Description: Bring the downturned "5" right hand, palm facing down, from the upturned left palm upward toward the head, closing the thumb to the fingertips as the hand moves.

Hints/Origin: Taking information from the page and putting it on the head.

Sample Sentences:

- I would like to learn how to type.
- What did you learn in school today.
- Have you learned how to swim yet?
- I learned a lot during my training.
- We will learn about helping customers.
- It takes time to learn about business.

Sample Print-Out
Graphics + Word
+ Description
+ Definition

Door

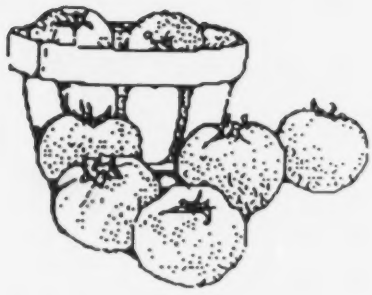
Description: Put index finger edges of "B" hands together, palms forward. Twist index side of the right hand back and forth from the wrist, two times.

Hints/Origin: Indicates a door swinging open.

Definition: (noun) a piece of wood, metal, or glass that closes an entrance; a barrier that must be opened to go in or out of a building or room

Sample Print-Out
Graphics + Word
+ Definition
+ Sentences

Tomato



Definition: (noun) a round red vegetable often used in salads

Sample Sentences:

- He put lettuce and tomato on his chicken sandwich.
- Ketchup is made from tomatoes.
- I'll have a bacon, lettuce, and tomato sandwich.

Sample Print-Out
Graphics + Word
+ Sentences

Book

Sample Sentences:

- I'm reading a book about jobs.
- She wrote a book about deaf culture.
- May I borrow your sign language book?
- Computer instructions are in this book.

Nurse

Same Sign for:

Description: Place extended fingers of right "N" hand on wrist of left hand.

Hints/Origin: Mime taking pulse.

Definition: (noun) a person who helps a doctor take care of patients

Sample Sentences:

- The nurse took my pulse and weighed me before I saw the doctor.
- When I was in the hospital, the nurse took my temperature.
- The school nurse sent the little boy home.

Adult Day Care, Health/Hospital

Sample Print-Out
Word Alone

Absent

Address

Afternoon

Again

Answer

Appointment

Ask

Bad

Bathroom

Before

Sample Print-Out
Word + "Same Sign"

Absent

Same Sign for: Gone

Address

Same Sign for:

Afternoon

Same Sign for:

Again

Same Sign for: Repeat

Answer

Same Sign for: Respond, Reply

Appointment

Same Sign for:

Ask

Same Sign for:

Bad

Same Sign for: Unfortunate

Bathroom

Same Sign for: Toilet

Before

Same Sign for:

Absent

Definition: (adjective) missing; not present; not here; not there

Address

Definition: (noun) the number of a house, name of a street and town where someone lives; the number, street, town and zip for a business or work place

Afternoon

Definition: (noun) the part of the day between noon and evening

Again

Definition: (adverb) another time; once more

Answer

Definition: (verb) to reply; to respond to a question: (noun) words spoken or written when someone has asked a question

Appointment

Definition: (noun) a time for a meeting; a plan for people to meet

Ask

Definition: (verb) to put a question to someone; to seek the answer to; to inquire

Sample Print-Out
Word + Definition
+ Sentences

Absent

Definition: (adjective) missing; not present; not here; not there

Sample Sentences:

- Pam was absent because she was sick.
- Many employees were absent because of the snow storm.
- The file clerk was absent for two weeks.
- We need another file clerk while Mary is absent.

Address

Definition: (noun) the number of a house, name of a street and town where someone lives; the number, street, town and zip for a business or work place

Sample Sentences:

- You will need to write your address on the job application.
- Don't forget to put your address on the envelope.
- You should memorize your new address.
- Where do you work? What is your address there?

Absent

Sample Sentences:

- Pam was absent because she was sick.
- Many employees were absent because of the snow storm.
- The file clerk was absent for two weeks.
- We need another file clerk while Mary is absent.

Address

Sample Sentences:

- You will need to write your address on the job application.
- Don't forget to put your address on the envelope.
- You should memorize your new address.
- Where do you work? What is your address there?

Afternoon

Sample Sentences:

- The afternoon mail is delivered at 3:00 P.M.
- We have a meeting a 1:00 this afternoon.
- I heard the news this afternoon after lunch.

Appendix D.
Vitae

ROLE IN PROPOSED PROJECT: PROJECT COORDINATOR

CURRICULUM VITAE

Helen B. Craig, Ph.D.

Position: Research Director

Western Pennsylvania School for the Deaf
300 Swissvale Avenue, Pittsburgh, PA 15218
412/371-7000

Fields of Specialization:

Special Education of Deaf Children
Language and Cognitive Development

Education:

Ph.D.	-- University of Pittsburgh, Pittsburgh, PA (Communications Research)	1968
M.A.	-- Williamette University, Salem, OR (Education)	1964
B.A.	-- University of Pittsburgh (Sociology & English)	1961

Scholastic Awards:

Phi Beta Kappa
Kappa Delta Pi (Education honorary)
Alpha Kappa Delta (Sociology honorary)
Graduated Summa Cum Laude

Professional Employment:

Research Director	-- Western PA School for the Deaf	1970-present
Assistant Professor	-- Univ. of Pittsburgh (Special Education & Rehabilitation)	1969-1973
Instructor	-- Oregon College of Education, Monmouth, OR (English Composition)	1964-1965
Teacher of the Deaf	-- Western Pennsylvania School for the Deaf	1959-1962
Editorial Assistant	-- American Annals of the Deaf: Washington, DC	1957-1959
Teacher	-- Bayside Elementary School, Princess Anne County, VA	1956-1957
Teacher	-- Troth Kindergarten Salem, OR	1962-1964

Certification:

CED (Council on Education of the Deaf): Professional Certificate, Elementary and Secondary Levels;

Pennsylvania State Certification: Instructional II in (1) Speech Correction and (2) Hearing-Impaired;

Specialist: Speech Linguistics & Reading -- Verbotonal Society of the Americas.

Professional Activities:

Editor: Reference Issue: (Director of Programs and Services), American Annals of the Deaf, 1970 to present.

Editorial Consultant: The Volta Review, 1986 to present.

Commissioner: Pennsylvania Public Television Network Commission (1976 to present), Member of the Executive Committee (1982 to present).

Vice President for Certification: Verbotonal Society of the Americas, 1986 to present.

Member: Institutional Review Board, Carnegie-Mellon University, (1978 to present).

Conference Participant: annual/bi-annual meetings of Conference of Educational Administrators Serving the Deaf (CEASD) and Convention of American Instructors of the Deaf (CAID) (1970 to present)

Conference Participant: Pennsylvania Speech and Hearing Association (PSHA): Member, Program Committee: May 1984; Section Chairman: 1987, 1982, 1975; Program Presenter: 1983.

Member: Pennsylvania Department of Education audit team for Approved Private Schools (1983-present).

Member: WQED Public TV Community Advisory Committee, (1979-1981).

Consultant: Trumbell County, Ohio, Board of Education re: ESEA Title IVC Project--"Improvement of Reading Comprehension Skills of Hearing-Impaired Children", (1980).

Professional Activities: (cont).

Participant: Institute in Linguistics (Generative Semantics) Providence College and Rhode Island School for the Deaf (June-July, 1976).

Participant/Speaker: Conference on Extended Low Frequency Amplification (ELFA) White Haven, PA (June, 1974) and ELFA Workshop sponsored by PA Dept. of Education, Pittsburgh, PA (July, 1976).

Member: Pennsylvania Dept. of Education Evaluation Committee for Temple University Program for Training Teachers of the Deaf (1975).

Member: National Advisory Committee--Annual Survey of Hearing-Impaired Children & Youth (1971-1974).

Consultant: Community and Counseling Center for the Deaf, Pittsburgh, PA, (1970-1971).

Professional Memberships:

Alexander Graham Bell Association
Association for Supervision and Curriculum Development
Conference of Educational Administrators Serving the Deaf
[Executive Committee (1982-1985); Joint Publications Committee (1980 - present)]
Convention of American Instructors of the Deaf
Council of Exceptional Children
Pennsylvania Speech and Hearing Association
Southwestern Pennsylvania Speech and Hearing Association
Verbotonal Society of the Americas

Publications:

Craig, H. B. & Gordon, H. W. (1987). Specialized cognitive function and reading achievement in deaf adolescents. Journal of Speech and Hearing Disorders, (in press).

Craig, H. B. (1987, Spring-Summer). Instrumental Enrichment: Process and results with deaf students. Thinking Skills Newsletter. Harrisburg, PA: PA Dept. of Education.

Craig, H. B. & Craig, W. N. (1971-present). Editors, Reference Issue: American Annals of the Deaf.

Craig, H. B. & Stool, S. E. (1986). "Otitis Media in a school for deaf children: an 8-Year study. Annals of Otology, Rhinology and Laryngology.

Craig, H. B. (1984, October-November). Software review: Lip-Reader Trainer Manual Version 1.3 The Volta Review, 86, (6).

Craig, H. B. et al. (1984). Curriculum in context: A working curriculum for elementary deaf students. Pittsburgh, PA: Western Pennsylvania School for the Deaf.

Craig, H. B. (1984, Winter). Language in use: A focus on pragmatics. Western Pennsylvanian, 92,(2).

Craig, H. B. (1983). Parent-infant education in schools for deaf children: Results of CEASD survey. American Annals of the Deaf, 128, 82-98.

Craig, H. B. (1983). Computer update: Into the fast lane with technology grants. Western Pennsylvanian, 91, (2).

Stool, S. E., Black, F. O., Craig, H. B. & Laird, M. A. (1981, July-August). Otologic care in a school for the deaf. Otolaryngol Head Neck Surg 89, 651-667.

Craig, H. B. (1981). Vestibular evaluation at Eye and Ear Hospital. Western Pennsylvanian, 87, (2).

Craig, H. B., Stool, S. E. & Laird, M. A. (1979). Project EARS: Otologic maintenance in a school for the deaf. American Annals of the Deaf, 124, 458-467.

Stool, S. E., Craig, H. B. & Laird, M. A. (1979). "Screening for middle ear disease in a school for the deaf. Proceedings of Second International Symposium: Recent advances in otitis media with effusion; Supplement to: Annals of Otology, Rhinology and Laryngology.

Craig, H. B. (1978). Feed-ahead and feed-back opportunities through federal funds. Western Pennsylvanian, 86.

Craig, H. B. et al. (1977). The language guide: A linguistic garden for deaf children (Book I: Basic sentence patterns; Book II: Syntax, Book III: Transformations). Pittsburgh, PA: Western Pennsylvania School for the Deaf.

Craig, H. B., Sins, V., Rossi, S. & Neisworth, R. (1976). Your Child's Hearing Aid. Lake Oswego, OR: Dormac, Inc.

Craig, H. B., Sins, V., Rossi, S. and Neisworth, R. (1976). Hearing Aids and You. Lake Oswego, OR: Dormac, Inc.

Craig, H. B., Craig, W. N. & Sehlin, C. (1976). Pittsburgh Auditory Test. Pittsburgh, PA: Western Pennsylvania School for the Deaf.

Craig, H. B. & Craig, W. N. (1986). Pittsburgh Auditory Test battery (PAT). In O. G. Johnson (Ed.), Tests and measurements in child development: Handbook II, II, (pp.924-926). San Francisco: Josey-Bass.

Craig, H. B. (1976). Original Written Language Inventory (OWL). Pittsburgh, PA: Western Pennsylvania School for the Deaf.

Craig, H. B. (1976). Original Written Language Inventory (OWL). In O. G. Johnson (Ed.), Tests and measurements in child development: Handbook II, I, (pp. 199-200). San Francisco: Josey-Bass.

Craig, H. B. (1976). Play and the deaf child. The publication: Children in contemporary society", 9, (4), 72-73.

Craig, W. N., Salem, J. M. & Craig, H. B. (1976). Mainstreaming and partial integration of deaf with hearing students American Annals of the Deaf, 121, 63-68.

Craig, H. B. (1975). Dormitory-classroom liaison. The Western Pennsylvanian, 84.

Craig, H. B. (1975). A residential school approach to mainstreaming deaf children. PRISE Reporter, (6).

Craig, W. N., Craig, H. B. & Burke, R. (1974). Components of verbotonal instruction for deaf students. Language, Speech and Hearing Services in Schools, V, (1).

Craig, H. B., Craig, W. N. & Bram, P. (1974). Evaluation Manual: Vol.II. Pittsburgh, PA: Western Pennsylvania School for the Deaf.

Craig, H. B. & Holman, G. L. (1973). The open classroom in a school for the deaf. American Annals of the Deaf, 118, 675-685.

Craig, W. N., Craig, H. B. & DiJohnson, A. (1972). Preschool verbotonal instruction for deaf children. Volta Review, 74, 236-240.

Craig, H. B. & Harkins, C. T. (1971). Instructional programs in a residential school for deaf children. Journal of the Pennsylvania Speech & Hearing Association, 4, 6-13.

Craig, H. B. & Holland, A. L. (1970). Reinforcement of visual attending in classrooms for deaf children. Journal of Applied Behavior Analysis, 3, 97-109.

Craig, H. B. (1970). Reinforcing appropriate visual attending behavior in classes of deaf children. American Annals of the Deaf, 115, 481-491.

Craig, W. N., Craig, H. B. & Burrows, N. L. A progress report --post secondary opportunities for deaf students. Volta Review, 72, 290-295:

Craig, H. B. (1965). A sociometric investigation of the self-concept of the deaf child. American Annals of the Deaf, 110, 456-478.

Presentations:

Craig, H. B. (1987, October). Four Years of Feuerstein. Paper presentated at PA Federation of CEC: 28th Annual Conference, Harrisburg, PA.

Craig, H. B. (1986). Specialized cognitive function and reading achievement. Paper presented at Eastern Regional Conference for the Deaf, Pittsburgh, PA.

Craig, H. B. & Stool, S. E. (1986). Otitis media in a school for deaf children: an 8-Year study. Presented at Workshop on Epidemiology of Otitis Media, Children's Hospital, Pittsburgh, PA.

Craig, H. B., Stuckless, R., Schein, J. & Deninger, M. (1986). Research and demonstration goals for the education of the deaf. Paper presented at the Conference of Executives of American Schools for the Deaf (CEASD), Long Island, NY.

Craig, H. B. (1986). Cognitive research at WPSD. Paper presented at Professional Association Meeting, WPSD, Pittsburgh, PA.

Craig, H. B. (1985). Cognitive research projects with deaf students at WPSD. Paper presented to Department of Special Education, University of Pittsburgh, Pittsburgh, PA.

Craig, H. B. (1985). Results of vestibular testing program at WPSD. Presented to Audiologic Group of Children's Hospital and Eye and Ear Hospitals, Pittsburgh, PA.

Craig, H. B. (1985). Pragmatics pointers for language instruction of deaf children. A Workshop for Teachers at the North Dakota School for the Deaf, Devils Lake, ND.

Craig, H. B. (1984, February-March) Pragmatics follow-up. Presentation to preschool, elementary and upper school departments, WPSD, Pittsburgh, PA.

Craig, H. B. (1983). Research at WPSD, Paper presented to Master's class in Deaf Education, University of Pittsburgh, Pittsburgh, PA.

Craig, H. B. (1982). Curriculum in context. Paper presented at the First Annual Language Coordinator's Workshop, Pennsylvania School for the Deaf, Philadelphia, PA.

Craig, H. B. (1982). Curriculum in context: Deaf children in focus. Paper presented at the Pennsylvania Speech, Language and Hearing Association, Twenty-third Annual Convention, Harrisburg, PA.

Craig, H. B. (1982). Verbotonal research and development components at WPSD. Paper presented at the American Verbotonal Society Annual Conference, WPSD, Pittsburgh, PA.

Craig, H. B. (1982). Parent-infant education: Report of a national survey. Paper presented at CEASD 54th Annual Meeting, Phoenix, AZ.

Craig, H. B. (1982, March 30-April 2). Language initiatives for deaf children. Paper presented at National Public Law 89:313 Providers Conference, Hershey, PA.

Craig, H. B. (1981). Verbotonal stories: Prelude to reading. Presentation to WPSD Parents' Association Meeting, Pittsburgh, PA.

Craig, H. B. (1979, 1980, 1981). Teaching Language to the Deaf. Paper presented to University of Pittsburgh class in Deaf Education, Pittsburgh, PA.

Craig, H. B. (1980, Fall.) Implementing the new elementary language curriculum at WPSD. Weekly workshops conducted for elementary teachers at WPSD, Pittburgh, PA.

Craig, H. B. (1974). Teaching language to the deaf. Paper presented at Extended Low Frequency Amplification, sponsored by the PA Dept. of Education. White Haven, PA.

Craig, H. B. (1974). Introduction to the verbotonal method. Paper presented at the Conference on Extended Low Frequency Amplification, sponsored by the PA Dept. of Education. White Haven, PA.

Craig, H. B. (1972). The changing role of the private residential school for the deaf. Paper presented at state-wide Conference on Deaf and Hard of Hearing, Harrisburg, PA.

Craig, W. N. & Craig, H. B. (1972). Verbotonal instruction for young deaf children: Question and replies. Paper presented at the Conference of Executives of American Schools for the Deaf, (CEASD), Toronto, CA.

ROLE IN PROPOSED PROJECT: PROJECT LIAISON

VITA

Rosemary P. Garrity

Educational Background:

Post-Masters Program	University of Pittsburgh, Pittsburgh, PA (Supervisory Certificate	(1982)
M. Ed.	University of Pittsburgh, Pittsburgh, PA Special Education -- Deafness	(1971)
B. A.	Mercyhurst College, Erie, PA Elementary Education	(1964)

Employment Data:

Director, Center Programs: Center On Deafness, 1989

Start-Up Coordinator: Center On Deafness: Western PA School for the Deaf (WPSD) 1985 to present.

Administrative Assistant--WPSD, (including IEP Coordinator and Coordinator of Student Teachers) 1982 to present.

Director of General Program, WPSD, 1984-1985

Acting Director of Upper School, WPSD, Spring 1984

Acting Director of Children's Services, WPSD, Winter 1984 & Winter of 1985

Acting Director of Special Studies, WPSD, Fall 1983

Consulting Teacher -- 1979-1984

Classroom Teacher -- Western PA School for the Deaf, Elementary, Junior High, Senior High 1966-1979

VITA Rosemary P. Garrity

Acting Director of Children's Services WPSD:	Winter of 1984 and Winter of 1985
Acting Director of Special Studies, WPSD:	Fall 1983
Consulting Teacher:	WPSD 1979 -1984
Teacher: Elementary, Junior High, Senior High, WPSD:	1966 - 1979
Teacher:	Johnstown School District Johnstown, PA 1964-65

Professional Activities:

Chairperson: "Make 'n Take" Workshop for Parents, 1980

Member: University of Pittsburgh Advisory Council in Special Education, Secretary 1983-85, President 1985

Member: Convention for American Instructors of the Deaf (CAID)

Member: Conference of Educational Administrators Serving the Deaf

Member: WPSD Institutional Review Board, 1985 - present

Member: PA Department of Education Audit Team for Approved Private Schools, 1986 - present

Conference Chairperson - Eastern Regional Conference for Educators of the Hearing Impairead - 1986

Member: A.I.U. Committee on Transition from School to Work - 1986

Member: Pennsylvania Speech Hearing Association

Coordinator: Western PA Deaf Senior Citizens Group

Member: Professional Association - WPSD, 1986 - present

Member: PA Department of Aging - Task Force on Senior Citizens Centers, 1988

VITA, Rosemary P. Garrity

Editor: Partners In Reading - 1980 to present

Participant: Linguistic Workshop, Providence College and Rhode Island School for the Deaf, 1979

Participant: PA Department of Education Workshop on Improving Supervision and Evaluation, 1982

Participant: "Learning to Accept Your Child's Handicap", Ken Moses, Philadelphia, PA 1984

Member: Board of Directors - Literacy Consortium of Allegheny County, on Adult Literacy, 1989

Certification and Specialized Skills:

Pennsylvania State Certification Instructional II -- Hearing Impaired

Pennsylvania State Certification Supervisory II -- Special Education

Council on Education of the Deaf: Elementary and Secondary Levels

Presentations:

Garrity, R.P.

The Open Classroom Presented to teachers at the South Carolina School for the Deaf. Spring, 1972

Experiment in Latitudinal Learning - The Open Classroom C.A.I.D. Convention, June, 1973

The Reading Program at WPSD P.T.A. and Staff In-Service, Spring, 1980

Partners In Reading Project - Two-day In-Service for teachers, St. John's School for the Deaf, Newfoundland, October, 1982

Reading Workshop for Parents - St. John's School for the Deaf, Newfoundland, June, 1983

VITA, Rosemary P. Garrity

Partners in Reading - presented at the P.S.H.A. Convention, Pittsburgh, PA, Spring, 1984

Partners in Reading - presented at the Eastern Regional Conference, Scranton, PA October, 1984

Developing A Literacy Consortium - (1990) panel participant at annual PA Association for Adult Continuing Education (PAACE) Conference

"Services Available to Deaf Senior Citizens" - presentation to Western PA Deaf Senior Citizen Group (1985 - present)

"Providing Services to the Hearing-Impaired Adults at the Center On Deafness" - presentation to SHHH (Self Helpfor the Hard of Hearing Persons (1988)

"Overview on the Center On Deafness" - for staff members of Office of Vocational Rehablilitation: State-wide regional offices (1986-1989) Eye and Ear Hospital (1986-1989) School and Parent Groups - statewide (1986-1989)

The Responsibilities of Supervising and Evaluating Teachers, - presentation to the University of Pittsburgh class in Deaf Education, 1986.

The Role of Supervisor at a Residential School, presentation to Dept. of Special Education, Supervisory Class, University of Pittsburgh, Pittsburgh, PA

The Center On Deafness, presentation to Verbotonal Society of the Americas, July, 1986

How Deaf Children Learn to Read, presentation to students at Slippery Rock College, June, 1986

The Transitional Program at the Center On Deafness, presentation at a conference on Transition sponsored by REACH, November 1986

The Transition Program at the Center On Deafness, presented to parents and staff at Shenango High School, May, 1987

Overview on the Center On Deafness Eye and Ear Hospital, 1988

VITA, Rosemary P. Garrity

Transitional Program - Annual Meeting of Technical Assistance for Sensory Impaired Persons (TASIP), Helen B. Craig, 1989

Overview of Transitional Program - In-Service for IU Special Education Teachers, August, 1989

PENNTEXT, National Convention of S-H-H-H, Little Rock, June 1990

The Transitional-Instructional Alternative, PA Speech and Hearing Association, Conference, April, 1990

Craig, H.B. and Garrity, R. (in Press, 1990)
The Post-Secondary Trnsition; From School to Independent Living. Chapter 5 in: Nowell, R and Marshak, L. (Eds.)

Craig, H.B. and Garrity R.P. (Eds.) (1990 April)
Resource information for staff involved with hearing impairment and aging, Pittsburgh, PA Center On Deafness at the Western PA School for the Deaf.

Craig, H.B. and Garrity, R.P. (Eds.) (1990 April)
Let's shape-up and reach . . . for communication! Hearing impairment and aging.: Participants manual, Pittsburgh, PA. Center On Deafness at the Western PA School for the Deaf

Craig, H.B. and Garrity, R.P.
"The post-secondary transition: from school to independent living." In R. Nowell and E.Marschak (Eds.) Understanding deafness and the vocational rehabilitation process. Needham Heights, MA: Allyn and Balm.

Publications:

"Experiment in Latitudinal Learning - The Open Classroom." Proceedings of the Forty-Sixth Meeting of the Convention of American Instructors of the Deaf, 1973.

"Partners in Reading", Editor, 1980 to present.

"Making the Most of Classroom Time", Perspectives, September, 1982.

VITA, Rosemary P. Garrity

"Eastern Regional Conference Sets New Records" - Western Pennsylvanian, Fall 1986.

"Transitional Program", Dimensions, Vol. 1. June 1987.

"Adult Education" - Dimensions, Vol. 2. Dec. 1987.

"Update on Center" - Western Pennsylvanian, Spring, 1988.

"The Center On Deafness", PASSAGE, June, 1991.

ROLE IN PROPOSED PROJECT: PROJECT DIRECTOR

William N. Craig, Ph.D.

Superintendent
Western Pennsylvania School for the Deaf
Pittsburgh, Pennsylvania
Executive Director
Center On Deafness

1969 - present

Ph.D.	University of Pittsburgh, Pittsburgh, Pennsylvania Audiology (1962)
M.S.	Gallaudet College, Washington, D.C. Education of the Deaf (1959)
B.S.	Washington & Lee University, Lexington, Virginia Government (1955)

Previous Employers

1965-69	University of Pittsburgh, Pittsburgh, Pennsylvania Director: Area of Education and Rehabilitation of the Deaf*
1962-65	Oregon College of Education, Monmouth, Oregon and the Oregon State School for the Deaf Director: Program in Education and Rehabilitation of the Deaf**
1959-62	University of Pittsburgh, Pittsburgh, Pennsylvania Part-time Assistant in Audiology and also part-time teacher of deaf children
1958-59	Gallaudet College, Washington, D.C. Kendall School for the Deaf Teacher of deaf children
1955-57	U.S. Army - 1st Lieutenant
Part-time	Community College of Allegheny County, Pittsburgh, Pennsylvania Lecturer (Summer Program)

*Initiated the fellowship program for Professional Sepcialists for the Deaf, an RSA funded program.

**Initiated the assistantship program for Rehabilitation Specialists for the Deaf, an RSA funded program.

Dr. William N. Craig has served as Superintendent of the Western Pennsylvania School for the Deaf for the past twenty years and has promoted the education, rehabilitation and welfare of deaf people in numerous ways.

As can be noted from the attached selected list, his professional articles have appeared in such journals as the American Annals of the Deaf, Rehabilitation Record, The Journal of Rehabilitation of the Deaf, Exceptional Children, The Volta Review, and Language, Speech and Hearing Services in Schools. He has served as faculty director of programs in Education and Rehabilitation of the Deaf which were supported by the Rehabilitation Services Administration and the former Department of Health, Education and Welfare.

While teaching, conducting research and preparing professional articles, Dr. Craig also served as Associate Editor of the American Annals of the Deaf and Co-Editor of the annual publication of Programs and Services for the Deaf. These responsibilities have continued from 1970 to the present. For the last nine years, he has served as one of four editors of the Journal of the Pennsylvania Speech-Language-Hearing Association.

In addition to the university and college grants for professional specialist preparation, Dr. Craig wrote training and rehabilitation grants for assisting deaf people directly. A major RSA grant (No. RD-2723-S-68) was awarded to the University of Pittsburgh and Dr. Craig to develop demonstration programs for the deaf at Delgado College, Seattle Community College, and St. Paul Technical Vocational Institute. Each of these unique programs is operating today and has served as the nucleus for the development of some 74 other post-secondary programs in the United States. In 1973, Dr. Craig was the Project Director for the Counseling and Community Services Center of the Deaf grant funded in part through the Social and Rehabilitation Service (RD-2264), another model program.

In addition, Dr. Craig has coordinated national, regional, and local meetings for educators, rehabilitation counselors and psychologists working with deaf people. These meetings have attracted a large number of professionals to Pittsburgh to present and discuss state-of-the-art procedures for working with the problems of deafness.

Most recently, Dr. Craig has been presented the Community Service Citation by the Pennsylvania Academy of Ophthalmology and Otolaryngology for 1985.

MEMBERSHIPS:

National Rehabilitation Association

American Speech and Hearing Association
Certification of Clinical Competence in Audiology

Conference of Executives of American Schools for the Deaf
Class A Certification as a Teacher of the Deaf

American Instructors of the Deaf

Professional Rehabilitation Workers with the Adult Deaf

Pennsylvania Speech and Hearing Association

Council for Exceptional Children

Alexander Graham Bell Association for the Deaf

NON-TEACHING EXPERIENCE:

Editor, Directory of Programs and Services and
Associate Editor, American Annals of the Deaf

Book Reviewer, Journal of Speech and Hearing Disorders (1968)

Consultant, U. S. Office of Education, Washington, D. C. (1970 -

Consultant, Rehabilitation Service Administration, H.E.W.
Washington, D. C. (Special Assignment)

Consultant and Professional Board Member, Pittsburgh
Hearing Society

Consultant, Vocational Rehabilitation Center, Pittsburgh

Part-time Audiologist, Pittsburgh, Pennsylvania
Eye and Ear Hospital (1959-62)

Coordinator, Oregon College of Education, Monmouth, Oregon
preparation of teachers of the deaf (1962-65) and
short-term programs in counseling the deaf, 1963-65)

Coordinator, University of Pittsburgh, Pittsburgh, Pennsylvania
Master's and Doctoral Study in Deafness, (1965 to 1969)

President, Greater Pittsburgh Hearing and Speech Council (1970-72)

PUBLICATIONS:

Craig, W.N., Carr,J. & Latham, I. Comparison of Two Methods of Teaching Written Language to Deaf Students. American Annals of the Deaf, March, 1964.

Craig, W.N. Effects of Pre-school Training on the Development of Reading and Lipreading Skills of Deaf Children. American Annals of the Deaf, May, 1964.

Craig, W.N. & Anderson, P.E. The Role of the Residential School in Preparing Deaf Teen-Agers for Marriage. American Annals of the Deaf, May,1966.

Craig, W.N. & Silver, N. Examination of Selected Employment Problems of the Deaf, American Annals of the Deaf, September, 1966.

Craig, W.N. (Ed.) Rehabilitation of the Deaf: Threshold of Innovation, Conference Report, University of Pittsburgh: Special Education and Rehabilitation, 1968.

Craig, W.N. & Barkuloo, H.W. (Eds.) Psychologist to Deaf Children: A Developing Perspective. University of Pittsburgh: School of Education, 1968.

Craig, W.N. "Language Learning in Children" and Craig, W.N. "Language Learning in Deaf Children." The Pennsylvania Department of Public Instruction, West Chester, Pennsylvania, 1968.

Craig, W.N. & Kates, S. Research Trends in Deafness, Special Report to the Vocational Rehabilitation Administration, 1969.

Craig, W.N. "Hearing Impairment", In Johnson, G.O. and Blake, H.D. (Eds.) Exceptional Children Research Review, Washington, D.C.: Council for Exceptional Children, 1969.

Craig, W.N., Craig, H.B., and Burrows, N. L. Post-Secondary Opportunities for Deaf Students: A Progress Report. The Volta Review, May, 1970.

Craig, W.N. "Vocational Education for the Hearing Impaired" In Young, E.B. Vocational Education for Handicapped Persons, Handbook for Program Implementation. Washington, D.C.: Office of Education, Bureau of Vocational Education, 1969.

Craig, W.N. and Collins, J. L. Analysis of Communicative Interaction in Classes for Deaf Children. American Annals of the Deaf, March, 1970.

Craig, W.N. and Collins, J. L. Communication Patterns of Deaf Students. Exceptional Children, Vol. 37, No. 4, 283-289, December, 1970.

Craig, W.N. and Collins, J. L. (Eds.) New Vistas for Competitive Employment of Deaf Persons. A monograph of the Journal of Rehabilitation of the Deaf, February, 1970.

Craig, W.N. Professional Preparation of Dormitory Counselors of Schools for the Deaf. American Annals of the Deaf, September, 1969.

------ "Craig Lipreading Inventory" in Jeffers, J. and Barley, M. Speechreading (Lipreading) Illinois: Charles C. Thomas, 1971.

Craig, W.N. et al., Preschool Evaluation Manual. Pittsburgh, Western Pennsylvania School for the Deaf, 1972.

Craig, W.N., Craig, H.B. and DiJohnson, A., Preschool Verbotonal Instruction for Deaf Children. The Volta Review, April, 1972.

Craig, W.N., Prospects for Residential Living in a School for Deaf Children. Handbook article, New York University publication, (Deafness Research & Training Center) July, 1972.

Craig, W.N., Shroyer, E., Siefried, J. Community Counseling Services for Deaf People. Rehabilitation Record, September, 1972.

Craig, W.N., Newman, J. and Burrows, N. L., An Experiment in Post-Secondary Education for Deaf People. American Annals of the Deaf, December, 1972.

Craig, W.N. "Post Secondary Education: Research Implications" Deafness Annual, P.R.W.A.D., Volume III, 1973.

Craig, W.N., Tomblom, D.H., Shroyer, E.H., and Siefried, J., Counseling and Community Services Center for the Deaf. A research report. Washington, D.C.: Departmen of Health, Education and Welfare, RD-2264, 1973.

Conference papers presented at meetings o the National Rehabilitation Association, Council for Exceptional Children, International Congress on Oral Education of the Deaf, World Fderation of the Deaf, (Warsaw.) and the Conference of Executives of American Schools for the Deaf (Toronto.) (Greensboro) (Rochester).

Craig, W.N., Shroyer, E. and Seifried, J. Community Counseling Services For Deaf People. In Man, Language, Speech and the Symbolic World, Washington, D.C.: Department of Health, Education and Welfare, Selected Report, September, 1973.

Craig, W.N. (Ed.) Directory of Programs and Services, American Annals of the Deaf, Vol. 118,3, 1973., Vol. 119,2, 1974, Vol. 120, 2, 1975, Vol. 121,2, 1976, Vol. 122,2, 1977,

Craig, W.N., Craig, H.B. and Burke, R. "Components of Verbotonal Instruction for Deaf Students." Language, Speech, and Hearing Services in Schools, A.S.H.A., 1974.

Craig, W.N., "Verbotonal Instruction of Deaf Children." PRISE Reporter, No. 5, May, 1974.

Craig, W.N. et al., Evaluation Manual, Volume 2. Pittsburgh: Western Pennsylvania School for the Deaf, 1974.

Craig, W.N. and Salem, James M. "Partial Integration of Deaf with Hearing Students: Residential School Perspectives". American Annals of the Deaf, Vol. 120, 1, 1975.

Craig, W.N., Salem, James M. and Craig, H.B. "Mainstreaming and Partial Integration of Deaf with Hearing Students." American Annals of the Deaf, Vol. 121,2, 1976.

Craig, W.N. "Curriculum: Its Perspectives and Prospects" The Volta Review Vol 78, 4, May, 1976.

Craig, W.N. "Residential Centers for the Hearing-Impaired and the Community". in Bradford, L.J. and Hardy, W.G. (Eds.) Hearing and Hearing Impairment, New York, Grune & Stratton, 1979.

Craig, H.B. and Craig, W.N. "Pittsburgh Auditory Test Battery (PAT)" in Johnson, O.G. (Ed.), Tests and Measurements in Child Development: Handbook II, Volume II, San Francisco: Jossey-Bass, (1976) pp. 924-926.

Craig, W.N. "Craig Lipreading Inventory" in Johnson, O.G. (Ed.) Tests and Measurements in Child Development: Handbook II, Volume I, San Francisco: Jossey-Bass (1976) pp. 172-174.

Craig, W.N. "Education of the Deaf" in Bluestone, C.D. and Stool, S.E. (Eds.) Pediatric Otolaryngology, Philadelphia, W.B. Saunders (1980)

ROLE IN PROPOSED PROJECT: LITERACY MATERIALS DEVELOPER

VITA: Sandra L. Mertens: Project Presenter

Educational Background:

M.Ed. University of Pittsburgh, Pittsburgh, PA
Special Education -- Deafness (1986)

B.A. Pennsylvania State University, University Park, PA
Communication Disorders, Teaching Hearing Impaired
(1985)

Certification:

Council on Education of the Deaf (CED)
Concentration in Elementary Hearing Impaired Education (1986)

Professional Employment:

Adult Literacy/Communication Strategy Instructor, Center On Deafness: Western PA School for the Deaf (1989-present)
[Provides workforce, community and personal literacy instruction for deaf adults; and provides communication strategy training for normally hearing community members, for staff at hospitals, nursing homes and emergency medical service units and for employers and co-workers in businesses employing deaf adults]

Therapist for Hearing Impaired Partial Hospitalization Program, Allegheny East Mental Health and Mental Retardation Center, Wilkinsburg, PA (1988-89)

Teacher: Self-Contained Hearing Impaired Classes, North Charleston High School, Charleston, SC (1987-88)

SKI HI Parent Advisor, South Carolina School for the Blind and Deaf, Charleston, SC (1987-88)

Itinerant Teacher of the Hearing Impaired, Charleston County School District, Charleston, SC (1986-87)

Home Intervention Instructor of Hearing-Impaired Preschoolers, Charleston County School District, Charleston, SC (1986-87)

Substitute Teacher, Western PA School for the Deaf and Pittsburgh Public Schools, Pittsburgh, PA (1985-86)

Professional Activities:

Member of a Task Analysis and Curriculum Development Team, The Hope Center (vocational center for severely and profoundly mentally handicapped adults) Charleston, SC (1987)

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Education

State University of New York at Buffalo, Buffalo, New York. B.A. English, 1968.

University of Pittsburgh, Pittsburgh, Pennsylvania. B.S. Computer Science, 1981.

Skills

Proficiency in desktop publishing, word processing, database management, and graphics scanning and editing. Computer languages include: Basic, Pascal, FORTRAN, COBOL, DEC Assembly Language, and Simula. Illustrator of books, newsletters, and brochures.

Work Experience

1989 - present

Computer Specialist/Materials Adapter. Western Pennsylvania School for the Deaf, Pittsburgh, Pennsylvania. Computer Specialist responsibilities described below. Managing Editor of *Building Together*, a monthly newsletter for parents and professionals serving hearing-impaired preschoolers. Responsibilites include writing, illustrating, and layout of newsletter. Write brochures for the Western Pennsylvania School for the Deaf and for the Center On Deafness about programs services, workshops, and seminars provided by both institutions. Write news releases for various journals and newspapers. Recipient of grant to develop software for a Sign Language dictionary.

1981 - 1989

Computer Specialist. Western Pennsylvania School for the Deaf, Pittsburgh, Pennsylvania. Wrote and documented software for the professional and support staff of the WPSD. Trained users to implement custom written software. Developed curriculum for and taught Computer Literacy and Computer Graphics courses. Developed and maintained various databases. Wrote software for research project conducted in conjunction with the University of Pittsburgh, Department of Psychology. Member of a software evaluation team selected by Gallaudet College.

1976 - 1981

Language Analyst/Research Assistant. Western Pennsylvania School for the Deaf, Pittsburgh, Pennsylvania. Assessed the linguistic ability of students. Devised and implemented test of readability levels of texts suitable for the deaf. Compiled and analyzed data derived from language and reading analysis.

1974 - 1975

Co-Chairman Scheduling. WQED, Pittsburgh, Pennsylvania. Directed scheduling of volunteers for the Great TV Auction.

Activities

Author/Illustrator. Children's books: Elizabeth Percy and Other Tales of Parental Persecution, Phineas Farthington Flake and the Great Flake Outbreak.

Co-Author. Edgewood Club Spring Show, 1989-1990.

Cast member. Edgewood Club Spring Show, 1988-1990.

References available upon request.

ROLE IN PROJECT: CONTRACTED COMPUTER CONSULTANT

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Vita

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Education

B.S. (1984) Carnegie Mellon University, Electrical Engineering and Applied Mathematics.

Appointments

1987 Project Manager
School of Computer Science, Carnegie Mellon University.

1985 Director of Software and Facilities
Center for Art & Technology, Carnegie Mellon University

1983 Research Programmer
GNOME and GANDALF Projects
Computer Science Department, Carnegie Mellon University

Projects

1989 Co-Principle Investigator, PREP Editor Project.
School of Computer Science, Carnegie Mellon University.
The PREP editor is a recently funded (3 years) NSF project to support research and development of environments that support collaborative writing of works-in-progress.

1988 Co-Principle Investigator, AdaEdu Project.
School of Computer Science, Carnegie Mellon University.
The AdaEdu project will research and develop a set of tools and other teaching resources that will faciliate using Ada in undergraduate computer science education. The software will be based on the existing MacGNOME editor platform.

1987 Project Manager, MacGNOME
The MacGNOME project is at the end of its initial 3 year NSF grant, and is preparing and planning for the next 5 years of research which will focus on new paradigms for programming, and new enviroments to support them. This summer th eproject will make final releases of its state-of-the-art programming environments for the introductory computer science.

Recent Publications

"The Design and Implementation of the Pascal GENIE" To appear in *Proceedings of the 1989 ACM Computer Science Conference* (CSC '89). Louisville, Kentucky, February, 1989. With Philip Miller.

"A Structure Editor Platform for Novice Programming Environments." In *Proceedings of the 1988 Asia-Pacific Conference on Computers and Education* (APCCE'88). Shanghai, China, October, 1988.

"Automatic Data Visualization for Novice Pascal Programmers" In *Proceedings of the IEEE 1988 Workshop on Visual Languages.* Pittsburgh, PA. October, 1988. With Brad A. Myers and Atul Sareen.

"The Ada Edu Project: Supporting the Use of Ada in Introductory Computer Science." In *Proceedings of the 1988 SEI Conference on Computer Science Education.* Fairfax, Virginia, April, 1988. With Terry Gill.